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WILD BLUEBERRIES
PREMIUM BY NATURE

Wild Blueberries

Wild Blueberry Commission OF MAINE

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October 31, 2011

Joint Standing Committee on Agriculture, Conservation and Forestry
100 State House Station
Augusta, ME 04333-0100

Dear Senator Sherman, Representative Edgecomb and Distinguished Committee members:

Following is our report to the Legislature on the programs of the Wild Blueberry Commission of Maine and Wild Blueberry Advisory Committee. Through the Wild Blueberry Commission, Maine's Wild Blueberry growers and processors have a vehicle to provide resources to improve Maine's Wild Blueberry businesses. This relationship created by the Legislature at the request of growers, dates back about 65 years.

Targeting resources at research and extension, promotion and policy issues facing Maine's Wild Blueberry growers and processors has helped to provide the foundation upon which Maine's growers have quadrupled their yields in recent history while at the same time increasing the total revenues of Maine's Wild Blueberry businesses.

We look forward to answering any questions you may have through the review process on behalf of the Commission and Advisory Committee. We look forward to continuing this public, private partnership for the future prosperity of Maine's Wild Blueberry growers and processors and the prosperity of the State of Maine.

Very Truly Yours,

David K. Bell
Executive Director

CC: Roy Allen, Chairman, Wild Blueberry Commission of Maine
Jerel Kim Higgins, Vice Chairman, Wild Blueberry Commission of Maine

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EXECUTIVE SUMMARY

The following program evaluation report for the Wild Blueberry Commission of Maine and the Wild Blueberry Advisory Committee is submitted to the Joint Select Committee on Agriculture, Conservation and Forestry in fulfillment of the "State Government Evaluation Act".

The future prospects for Maine's Wild Blueberry growers and processors are very promising. Through the application of research conducted at the University of Maine and extension outreach, growers have quadrupled Maine's production of Wild Blueberries in the last 30 years. Strategic promotional decisions made to develop a brand identity for Wild Blueberries coupled with development and implementation of health promotion strategies has resulted in favorable markets for Wild Blueberries.

The last six years were a comparatively prosperous time in Maine's Wild Blueberry business. Crop sizes moderately increased and demand grew. However, the economic downturn did result in a couple of challenging years. Moderately strong market prices in four of the last six years coupled with reasonably large crop sizes resulted in growers receiving the highest gross revenue in any six year period in the history of the business (Figure 6). The strong prices did not necessarily result in record profits as many growers made long term investments in land leveling and irrigation capacity. In addition, annual energy and fertilizer input costs increased rapidly during the same period. Currently demand is strong relative to supply, and Maine's Wild Blueberry business is strong despite widespread challenges across the economy.

In order to keep the Wild Blueberry business strong, regular investments need to be made in research, extension, promotion and other emerging issues as they arise. Maine agriculture will need policy support from the Legislature in key areas such as research and development, crop protectant use and land use issues that support agricultural production.

We thank the Legislature for past and recent support and look forward to working with the Legislature on future issues of importance to Maine's Wild Blueberry growers and processors.

I. INTRODUCTION

Purpose and Goals of the Wild Blueberry Commission of Maine

The mission of the Wild Blueberry Commission of Maine is to provide the foundation upon which Maine's Wild Blueberry growers and processors can build profitable businesses. Title 36, section 4301 states the purpose as: "The production and marketing of wild blueberries is one of the most important agricultural industries of the State, and this chapter is enacted into law to **conserve and promote the prosperity and welfare of this State and of the wild blueberry industry of this State by fostering research and extension programs, by supporting the development of promotional opportunities and other activities related to the wild blueberry industry"** (emphasis added). The full statute related to both the Wild Blueberry Commission of Maine and the Wild Blueberry Advisory Committee is contained in Appendix A.

Organizational Structure

The Wild Blueberry Commission of Maine serves the priority needs of Maine's Wild Blueberry growers and processors. The Commission appoints the Wild Blueberry Advisory Committee (figure 1) to set research priorities and make research and extension recommendations. This committee also works to obtain research grants and supports wild blueberry researchers' submission of grant proposals for funding of priority projects.

The Commission achieves their promotional objectives through the Wild Blueberry Association of North America (WBANA). Annually the Commission makes grants to fund WBANA's operating plan for Wild Blueberry promotion.

The Commission employs a full time executive director to plan and execute Commission activities; provide staff support to the Advisory Committee; and to administer the Commission business. Currently the Commission funds a Director of Programs to support WBANA's Off-Shore Promotion Program and other Commission programs. The Commission also funds administrative staff to support Commission and WBANA programs.

II. WILD BLUEBERRY COMMISSION PROGRAMS

Research and Extension

Maine's Wild Blueberry businesses are built upon the foundation of research and extension. Extension (University of Maine Cooperative Extension) has been and is the traditional development arm for agricultural research.

Our modern day research and extension relationship with the University of Maine dates back to 1945 when Maine's (wild) blueberry growers approached the Legislature to establish a self imposed tax to raise funds for blueberry research. Research and extension has provided the information for Maine's growers to quadruple their crop in the last 30 years (figure 2). The research program has also provided information and assisted Maine processors in developing state of the art processing facilities to produce a product of ever increasing safety and quality.

Maine's Wild Blueberry research and extension program is guided by the University of Maine System Wild Blueberry Advisory Committee (WBAC). The WBAC is a standing committee of the Wild Blueberry Commission established by the Legislature. The seven members of the WBAC are appointed to four year staggered terms by the Wild Blueberry Commission. The WBAC sets the strategic direction, makes annual funding recommendations, and monitors the progress of Wild Blueberry research and extension programs.

Research recommendations are developed through an iterative process with researchers whereby challenges facing the industry are discussed, and pre-proposals are developed and presented to the WBAC by researchers. The WBAC requests final research proposals from researchers and then makes research recommendations that are forwarded to the Dean of the University of Maine's College of Natural Sciences Forestry and Agriculture and the Director of the Maine Agricultural and Forestry Experiment Station.

Currently, funding for projects comes from the Wild Blueberry tax funds dedicated for research and extension, competitive grants, and base funding from the University of Maine including both State and Federal funds. In Federal fiscal year 2010, Congressionally directed funding administered through USDA, averaging $225,000 per year in recent years, for wild blueberry research and extension ended. Much of this funding was used to support Integrated Pest Management Programs. In 2011 Maine's Commissioner of Agriculture made Integrated Pest Management a funding priority of Federal Specialty Crop Block Grant funds in a competitive process administered by the Maine Department of Agriculture. The Commission, in partnership with the University, was successful in securing some IPM funding that partially replaced some of the directed USDA research and extension funding.

In 2009 the University of Maine was successful in obtaining a USDA Specialty Crop Research Initiative grant of $1,100,000 for a four year cropping systems study

comparing four levels of management; high, medium, low and organic. The Advisory Committee actively guided the development of this project which took two proposal submissions over two years before the grant was successfully awarded. The Commission provided over $310,000 in matching funds for the grant. Over the last 30 years a relatively large menu of management practices including Integrated Pest Management (IPM) methods, were developed for growers to apply to their lands in an Integrated Crop Management (ICM) system. A relatively high, medium, low or organic input system can be the result depending on applicable practices used. To date, there has not been a study that looks at the potential economic yield of the various systems nor compares relative berry quality across the systems. The goal of this study is to compare these systems and the potential economic returns to the grower such that it aids in land managers making decisions on what type of management system they want to apply to their wild blueberry lands.

The Commission also works closely with key researchers at the University to pursue other competitive grant opportunities to address specific challenges and opportunities. Many letters of support for grant applications are written annually.

Maine's Wild Blueberry growers and processors fully understand the need for a strong research and development (Extension) program in order to maintain and grow Maine's Wild Blueberry businesses in an increasingly competitive global market place. The Wild Blueberry Commission and Advisory Committee became involved in the State's R&D initiative thirteen years ago because funding cuts at the University of Maine in the early 1990's were having a serious and negative impact on critical agricultural research needs at the University.

The fiscal challenges at the state level in recent years have resulted in flat funding to the University, however operating costs such as energy and health insurance for employees continue to increase. Since teaching and research are human capital intensive endeavors, the only significant area where the University can generate funds for these increased costs is by reallocating salary to these other expenses. A couple of years ago the College of Natural Sciences Forestry and Agriculture at the University projected they would lose 25-30 percent of current research faculty in this period of fiscal challenge so that the salaries saved could be applied to meet their share of increased University costs.

Loss of faculty working on research in support of Maine's natural resource based business is a high concern. We see this as a critical issue that needs to be addressed in partnership with the Legislature. A strong research faculty is necessary to meet the research needs and write the proposals to pursue grant funding for priority research projects.

Another area of high concern is the changing complex of pests, specifically weeds, diseases and insects. Changes include the introduction of invasive species and a more variable and longer growing season. These factors give advantages to pests that may not have been competitive enough in the past to negatively affect yield and quality.

Promotion

Promotion is a priority of Maine's Wild Blueberry growers and processors. Over the last six years approximately two thirds of the Commissions' financial resources have been allocated to promotion. The Commission accomplishes its promotion objectives through the Wild Blueberry Association of North America (WBANA).

The Wild Blueberry Association is a unique organization in that it is a promotion organization supporting Maine's Wild Blueberry growers and processors. Currently Maine produces approximately 35% of the North American Wild Blueberries. Quebec and the Canadian Maritime Provinces produce the remainder. The size of the Canadian crop continues to grow faster than the Maine crop. For example, 15 years ago the Quebec crop averaged around 15-20 million pounds, now it averages around 70-80 million pounds. Not too long ago Maine produced approximately half of the commercially grown Wild Blueberries.

There is also a Wild Blueberry Association of North America incorporated in Canada carrying out the promotional objectives of Canadian growers and processors. WBANA US and WBANA CA are separate legal entities solely governed by their respective Boards on either side of the border. However, every fall over the last six years a joint meeting of the respective organizations has occurred to coordinate Wild Blueberry promotion programs around the world. While each organization is 100% responsible for their respective promotion programs, the two organizations work to coordinate their efforts for increased effectiveness around the world in order to maximize limited promotional dollars.

Maine has taken the primary responsibility of promoting Wild Blueberries in the U.S. market, currently the largest single Wild Blueberry market in the world, while Canada focuses on off shore promotion in Europe and Japan. Since 2008 Maine has been working to develop markets in China, the mid-east and over the last couple of years South Korea.

The Legislature is aware of the business challenges that Maine's natural resource businesses such as Christmas trees and wreaths, forest products, lobsters and potatoes face as Canada strongly supports their natural resource based businesses. Maine's Wild Blueberry businesses face the same challenges, however, they have decided that by creating large enough global demand for Wild Blueberries both Maine's and Canada's Wild Blueberry businesses can be successful. Over the last 30 years, Maine's growers and processors have taken a leadership role in developing the potential of WBANA such that there is enough demand to utilize the ever increasing Wild Blueberry crop.

Cultivated blueberries have a different growing system and market niche. Their large size is an advantage when marketing directly to the consumers because most consumers "buy with their eyes". The majority of cultivated blueberries are sold

fresh to consumers. Cultivated blueberries have also been bred to have thicker skins so they can withstand the rigors of the fresh produce food distribution system. However, cultivated berries not sold fresh are frozen and compete with frozen Wild Blueberries. Frozen Wild Blueberries have other advantages over the cultivated berry such as superior taste and superior performance in baked goods due to a smaller size. Wild Blueberries are primarily a frozen product or once frozen further processed into other forms. Less than 1 percent of Maine's berries are sold fresh.

In the early 1990's, Maine and Canada's Wild Blueberry growers and processors made the strategic decision to break away from the North American Blueberry Council, hire a professional promoter, and develop a brand identity for Wild Blueberries to differentiate Wild from cultivated in the market place. The objective was to create demand for Wild Blueberries in the market place which results in stronger prices for Wild Blueberry growers and processors.

Over the last six years WBANA US has continued to develop and implement an integrated promotional program for the US Wild Blueberry market. During this period WBANA has continued to foster the "Health Story" because the industry believes that this effort over the last dozen years has been a key to creating awareness with consumers and driving demand for Wild Blueberries. Recent promotional plans have focused on the trade ingredient market, the traditional market for frozen individually quick frozen (IQF) Wild Blueberries and other processed forms. Equal effort has been made to support the growing retail frozen Wild Blueberry market which has been an objective of the industry since the late 1990's. The promotional materials in this report illustrate a clear distinction in messaging for the "trades" and the consumer.

Promotional collateral material for the trade ingredient users over the last six years is located in Appendix B. These pieces explain the attributes of Wild Blueberries to trade ingredient buyers and differentiate Wild from cultivated blueberries. They also educate customers about different forms available from processors. Brochures were also developed to explain the health attributes of Wild Blueberries. In reviewing the pieces in Appendix B, a progression from longer to shorter format is apparent. This evolution recognizes that potential buyers will research more detailed information from WBANA's Wild Blueberry web site.

The trade promotional materials also introduce the updated certification mark launched in 2009. During the depth of the recession and market decline of Wild Blueberries in 2008 and early 2009, the industry, working with its agency, decided to reposition Wild Blueberries and update the Wild Blueberry Certification Mark launched in 1994. The updated mark incorporates the now widely recognized attribute of "antioxidant rich" and positions Wild Blueberries as a premium, natural product with the tag line "premium by nature". The decision to update the certification mark was a big step to adjust the position of Wild Blueberries in the market place.

During the last six years WBANA has participated in 2-3 trade shows per year. Trade shows attended in recent years include the "Institute of Food Technologist, Food Marketing Institute, National Restaurant Association, International Baking Industry Exposition, United Fresh Product Association, and Supply Side West. Additionally 1-2 consumer oriented trade shows were attended annually with a consumer focused message on health and purchasing frozen Wild Blueberries at retail. The focus of the consumer trade show effort has been on influencers such as dietitians at the American Dietetics Association Food and Nutrition Conference and the Produce for Better Health. Appendix C illustrates graphic design and messaging for both the trade ingredient shows and the consumer oriented shows.

As part of an integrated promotion and marketing effort advertisements were placed in selected trade publications and consumer oriented publications such as Health Magazine and the New York Times Sunday newspaper magazine. The ads presented in Appendix D show both the evolution of the marketing message in six years as well as difference between trade oriented ads and consumer messaging that is positioned to target consumer retail. Ads in 2010 took advantage of the listing of Wild Blueberries as one of Health Magazine's Top 10 Superfoods for Women. Wild Blueberries were the only fruit listed.

WBANA recognizes there are challenges in expanding the frozen retail market. One of the challenges is the fact that consumers do not understand that the nutritional value of frozen fruits is equal to or greater than fresh. Many consumers assume "fresh" in the grocery store has higher nutrient content than frozen, when in fact, many times the nutrient content of fresh is less compared to berries frozen within 24 hours of harvest. Second, many consumers do not know where frozen fruit is located in the grocery store. Usually it is in one small case close to frozen desserts with no obvious signage. Third, most consumers are not aware of the relative value of frozen Wild Blueberries compared to fresh especially during the months when fresh cultivated North American blueberries are not available. Over the last year the consumer messaging has focused more on the relative value of Wild Blueberries.

Since the late 1990's a key component of WBANA's promotional efforts has been a public relations (PR) media strategy to educate the public on the health benefits of Wild Blueberries such as their antioxidant properties. Over the last thirteen years WBANA has used both "free media" and paid efforts. Much of the focus has been on print media whereby press releases on new health research are widely distributed to newspapers and health related magazines (Appendix E). WBANA also has invested considerable sums to successfully pitch show segments on Wild Blueberries to influential talk television shows such as the Oprah Winfrey and Dr. Oz Shows. Segments featuring the health attributes of blueberries have also run on weekday shows such as "Today". Cooking and lifestyle shows have also been a major target.

Faced with a challenging market in 2009 the Commission decided to pursue Federal Specialty Crop Block Grant (SCBG) funds (administered by the state

Department of Agriculture) for a three pronged media effort to educate consumers on the health benefits of Wild Blueberries and consuming fruits and vegetables. A satellite media tour was developed for TV and radio. Satellite media tours consist of TV and radio shows developed then uploaded on satellite for TV and radio stations to access for their programming. The cost to WBANA is to develop the content for stations to air. This Wild Blueberry show was aired on 18 TV and 10 radio markets reaching an audience of 10 million.

Another prong of this public relations effort was the development of a food page feature for the lifestyle pages of newspapers across the country. This feature contained beautiful pictures and recipes on how to use the product. The target market of this approach is smaller newspapers across the country that cannot afford to develop this content. Results were impressive with 217 newspapers picking up the feature reaching an audience of 8.3 million readers. There was also had an integrated online component resulting in 422 placements and 15 million online impressions.

The third component of the SCBG effort was the development of radio public service announcements (PSA). WBANA partnered with the national nutrition education group Produce for Better Health. The PSA had to include a broader nutritional message than Wild Blueberries to be aired. In the PSA, WBANA incorporated the message that frozen fruits and vegetables were a great way to meet nutritional goals and Wild Blueberries were used as a specific example. A few months after release, this PSA had been played on 172 stations nationwide, in 71 markets including 8 of the 10 largest in the U.S., resulting in 14,204 airings and resulting in 31 million impressions. WBANA could never afford to purchase enough consumer advertising to reach as many consumers as were reached through these efforts.

Other recent PR related events include Health & Wellness Day in New York City sponsored by the New York Times. This event also had coordinated advertising in the Times Weekend Magazine section and a web component. WBANA has also partnered with Maine chefs for cooking show opportunities, health related stories were made available to national radio markets and this summer Dr. Oz featured one of the health researchers WBANA has worked with since the 1990s, Dr. Mary Ann Lila. Lila spoke about research that focused on Wild Blueberries and cancer prevention. WBANA has also completed recent Wild Blueberry media features with Paula Deen and another satellite media tour with Allison Fishman author of "You Can Trust a Skinny Cook".

A wide spread media public relations effort continues to be a major successful focus of WBANA's Wild Blueberry promotion and marketing efforts.

Another area of significant promotional investment over the last six years has been the Wild Blueberry web site, "wildblueberries.com" and related social media such as facebook and twitter. The web site has gone through a couple of extensive redesigns and is updated regularly. Examples of recent web pages are included in

Appendix F. Over the last six years a large effort has been made to integrate the web site into other promotional efforts such as the New York Times health seminar and PR opportunities such as Allison Fishman's show "Cook Yourself Thin." WBANA also sponsored a "Twitter Party" in conjunction with a satellite media tour focused on Wild Blueberries. Utilizing these events to create interest and drive people to the WildBlueberries.com web site has been successful (Appendix F). The agency has also worked on developing organic and paid search strategies to drive more viewers to the WBANA website.

Maine's Wild Blueberry industry's capacity to directly advertise to consumers is limited by financial constraints which is why vehicles such as free and low cost public relations and a web strategy have been pursued over the last thirteen years. However, investments have also been made that directly target the consumer in support of the Maine growers who sell freshly harvested Wild Blueberries direct to consumers during the summer season. Appendix G contains consumer health and recipe brochures. Also included is a trade show flyer for fresh Wild Blueberries and point of purchase "Get Wild" cards posters that can be used in farm stand and grocery retail outlets. Growers who market fresh Wild Blueberries at Maine's farmers markets and at farm stands have stated the effectiveness of WBANA's Health Story Public Relations efforts in educating their customers about the health benefits of Wild Blueberries. While fresh sales are only less than 1 percent of industry sales, they are an important source of revenue for a few dozen growers in Maine and are important representation of the industry to Maine consumers and summer tourist visitors.

Over the last six years the Commission through WBANA has successfully executed an integrated promotion and marketing program for Wild Blueberries that incorporated trade shows, collateral material, advertisements, public relations and paid media, and internet and social media activities.

Other Commission Programs

Wild Blueberry Commissioners understand that many other factors besides research and promotion can affect the business climate for Wild Blueberry growers and processors. The Commission's executive director with professional assistance works closely with the Legislature on issues of importance to Maine's farmers and food processors. Within the constraints of resources, the Commission also works with Maine's Congressional delegation and crop groups across the nation on Federal issues such as research, crop insurance programs, and conservation programs. The Commission was an active member of the Specialty Crop Farm Bill Alliance based in Washington DC that worked on the current farm bill and is engaged on the upcoming farm bill. Specialty crops include vegetables, fruits, nuts and ornamental horticultural crops that account for approximately half of the farm gate value across the United States. Programs that were supported by the Alliance and the Commission include the Specialty Crop Research Initiative, Specialty Crop Block Grants, and USDA, NRCS Conservation Programs. Maine has a very diverse agricultural industry. Maine's farm gate is primarily from Specialty Crops

including Wild Blueberries after accounting for dairy, egg and livestock production. The USDA programs mentioned above have directly supported Maine's Specialty Crop producers.

The Commission supports Wild Blueberry activities around the State at fairs and other events. Fairs and events are supported with materials such as recipe brochures (Appendix G), posters (Appendix G & I) and other collateral material. Events such as wild blueberry pie baking contests are supported with T-shirts, aprons, and loaning out banners.

Another successful effort has been the Wild Blueberry placemat program (Appendix H). Approximately 200,000 placemats are produced annually and distributed to local restaurants during July through September. Restaurant owners report that they help to increase sales of Wild Blueberry menu offerings. They also help to educate summer visitors and Maine's citizens on the uniqueness of Wild Blueberries as well as their health attributes. While supporting fresh wild blueberries during the season, the Commission also makes the link for consumers that frozen Wild Blueberries can be purchased year round and are easy to incorporate into their daily diets.

The brochure "Maine's Wild Blueberry Lands" (Appendix H) was produced to provide general information to the public about Maine's unique Wild Blueberry industry. Educators can also request this brochure and health/recipe brochures for their students. This brochure has also been provided to snowmobile and ATV clubs in Wild Blueberry growing areas in an effort to educate riders about the industry and reduce damage to Wild Blueberry fields.

In 2008 WBANA conducted an economic impact study of the Wild Blueberry business in Maine similar to recent efforts by other agricultural groups in Maine. Utilizing the results from this study the Commission developed the informational piece "Maine's Wild Blueberry Business: Innovation, Growth, Impact; Economic Impact and Fiscal Impact on the State of Maine" (Appendix H) to help communicate the importance of the Wild Blueberry business in Maine and the fact it is a growth business, increasing in size over 4 times in the last 30 years.

Over the last thirteen years the Commission has worked state wide to get the blueberry health story into the media in order to raise the awareness of Maine's Official State Berry and develop a sense of pride with Maine citizens for our special fruit. Press releases on new health findings related to Wild Blueberries developed for nationwide distribution are customized for Maine thereby leveraging the investment.

The Commission also provides educational outreach to Maine's school children through its Wild Blueberry Classroom Curriculum (Appendix I) and supports educational events such as Maine Environthon. The commitment to education stems from the belief that many students in Maine do not think about or often understand where their food comes from, their relationship to food production and

the environment, and how locally produced food fits into our Maine culture. The attached Wild Blueberry curriculum (Appendix I) was professionally developed for grades 4-6 and tested in Maine schools prior to final production 10 years ago. Two years ago the curriculum was updated and electronic formats were added in addition to the hard copy. The poster included as a part of the kit was updated at the time of curriculum development.

The updated curriculum was provided to all Maine 4th grades. Additionally, hundreds of kits are provided to Maine educators at special field days or upon request annually. Soon after the original release of the kit the Commission received many requests from home schoolers. A large effort was made by the Commission to place a copy of the kit presented in a binder to all 279 public libraries across the State of Maine to honor these requests. Updated kits were once again provided to all public libraries.

The Commission worked closely with Maine Agriculture in the Classroom in the development and distribution of the curriculum and appreciates their efforts. The Commission's executive director has served on the new Maine Agriculture in the Classroom Council established by the Legislature to administer the "Ag Tag" revenue from the agricultural license plate in support of agricultural education across Maine.

Performance of Programs

The Commission's legislative charge is to "**conserve and promote the prosperity and welfare of this State and of the wild blueberry industry of this State**". A few relevant measures of the prosperity of the Maine's Wild Blueberry industry are the crop size and price to growers and processors.

Research and Extension

The crop size trends size are an indication of the effectiveness of the research and extension program. If growers have the information they need to manage their crops and there is a market, crop size will be maintained or will increase.

During the period 1960 through 1980 the crop size averaged about 20 million pounds per year (figure 2) and remained consistent. During the period from the early 1980's through 2000 the average crop size increased from 20 million to over 75 million pounds per year. There was a dip in 2005 five year rolling average due to poor crops in 2004 and 2005 resulting from unfavorable weather and the loss of the record 2000 111 million crop from the average. However, the growth in Maine's crop has resumed in the last five years with the average of about 83 million pounds.

Continued increases in crop size indicate that growers are receiving the information they need to improve their management practices. This trend indicates that the University of Maine Wild Blueberry research and extension programs supported by the Commission are contributing to the prosperity of the industry.

Promotion

The United States Government has had a long standing policy to encourage the production of safe, inexpensive food in the United States. In this country we are blessed with a bountiful supply of high quality inexpensive food. Sadly, this policy has often resulted in a difficult business climate for growers, especially when supplies are increasing and/or are temporally large. Increasing crop size and large annual crops often mean lower prices to growers.

Wild Blueberry growers and processors have experienced these price cycles related to crop size in the past. Figure 5 shows the Wild Blueberry price paid to growers and processors during the last 20 years. The low price period of 1993 – 1995 was a result of the large 1992 crop (figure 4) and relatively strong crops in the years after. Since Wild Blueberries can be stored in freezers for two years with no loss in quality, it took a few years for the inventory over supply to be corrected. During the late 1990's crop sizes were relatively stable, demand was increasing and prices (figure 5) were relatively strong. In 2000, Maine had the record 111 million pound crop (figure 4) followed by large crops in Canada 2001-2002 which resulted in a period of low prices (figure 5) in the market. The period 2005-2007 resulted in strong price increases with frozen wild blueberries exceeding $2.00 per pound. Many growers and processors in the industry recognized that the 2007 prices were unsustainable and would diminish future demand. Some characterized the 2007 market as the "blueberry bubble".

2008 and 2009 resulted in decreasing prices with 2009 being a difficult year as prices bottomed out. However, the industry did not sit back and wait for change in market conditions. In late 2008 the decision was made to update the Wild Blueberry brand identity, be more aggressive in market positioning and invest more funds in Wild Blueberry promotion. The industry also initiated off shore promotion programs in China the mid-east and South Korea during this time period.

Some indications of the success of Wild Blueberry promotion programs are pricing trends and the overall revenue to growers over time.

In the last six years (2005-2010) growers received the largest gross revenues in the history of the industry five out of six years (figure 6). The year 2000 in which 111 million pounds were produced is the 5th highest grossing year. Gross revenue to growers is a function of production times the per unit price. Figure 2 illustrates that in the recent period the size of Maine's Wild Blueberry crop has regained its upward trend. Prices peaked in 2007 and bottomed out in 2009. However there were reasonably strong prices in the years surround the high and low market prices. These prices coupled with relatively strong crops resulted strong gross revenues into the industry during this period.

The large growth in the blueberry supply world wide is largely driven by cultivated blueberries. The Maine Wild Blueberry crop continues modest growth. There has

been a focused effort through the Wild Blueberry Association of North America to promote Wild Blueberries and further differentiate them from cultivated blueberries. Considering that the price of Wild Blueberries is trending up at the same time the crop size is increasing resulting in record revenues to growers, it is reasonable to conclude that promotion is having a positive effect on Wild Blueberry demand and resulting prices to Maine's Wild Blueberry growers and processors.

III. EMERGING ISSUES

Agricultural and Research and Extension Capacity of the University of Maine

The University of Maine is critical to the future of Maine's Wild Blueberry growers and processors because it is the research and development (Extension) capacity of the industry. The University of Maine is the only institution in the United States that does research on the management and processing of Wild Blueberries. While other agricultural crops may be able to obtain up to date research from states such as New York or Pennsylvania, this is not an option for Maine's Wild Blueberry growers.

While the Commission appreciates the fact the Legislature has not cut the University budget during these difficult fiscal times, because costs such as health care and energy continue to rise, the University has had to reduce faculty with research appointments in order to meet budgets. The other dynamic that is developing is that an increasing percentage of the University budget is being generated by tuition. Since this revenue stream is increasingly important to their budget the University has correctly focused on meeting teaching demands.

The University of Maine is unique among the 7 Umaine campuses in that as a Land Grant University it has a tri-part mission of teaching, research, and public service in support of the state and its people. We are concerned that with the cumulative effect of budget cuts that the research and extension needs of Maine's Wild Blueberry growers and processors will not be met unless trends are reversed. Not meeting the research and extension needs of the industry would severely diminish the growth potential of the industry.

Growth of the Blueberry Crop World Wide

The cultivated blueberry is projected to grow from over 750 million pounds in 2010 to 1.3 billion pounds in 2015. It is imperative that Wild Blueberry growers and processors are successful in differentiating the attributes of Wild Blueberries to customers in the trades and to consumers of retail frozen Wild Blueberries such that the market for frozen Wild Blueberries results in prices high enough to maintain a healthy industry in Maine. Executing a promotion program with enough creativity and resources to achieve market conditions in support of Maine's Wild Blueberry growers and processors will continue to be a challenge with resources available.

Federal Regulatory Issues

There are a range of Federal regulatory issues that affect Maine farmers and food processors. One issue that is not resolved is whether or not the application of pest control materials will be regulated under two statutes, the Federal Insecticide, Fungicide and Rodenticide Act as they have been for thirty years, or will they also be regulated under the Clean Water Act as a recent court decision directed. To date the Federal Environmental Protection Agency (EPA) has not been able to address this dual regulatory charge in an effective way for farmers, other applicators; and state and federal regulatory agencies.

A similar challenge is that the EPA and the Federal wild life agencies (US Fish and Wild Life Services and National Marine Fisheries Services) have not been able to come to agreement on an effective approach to the review of pesticides under the Endangered Species Act (ESA). EPA has the expertise to conduct these assessments, however, the Services who do not have the expertise or capacity are unwilling to allow EPA to take the lead in risk assessments. EPA is mandated to review the registration of all pesticides every 15 years. If the Federal agencies cannot agree to an environmental review system then many more law suits are sure to come about resulting in a review effort that is driven by court deadlines and not a systematic, through review of the science. This Federal regulatory short coming could jeopardize the registration of many pest control products.

IV. ADMINISTRATIVE EFFICIENCIES AND OUTREACH

Coordination with Other Agencies and Organization

The Wild Blueberry Commission of Maine works hard to reach out to other agencies and organizations because as one small agricultural interest we cannot solve our problems alone. We look for every opportunity to work with the Maine Department of Agriculture Food and Rural Resources. The Commission is a member of Maine Farm Bureau and the Commission's executive director is currently on the board of directors of the Agricultural Council of Maine and is a past president. Through these two organizations, the Commission works to coordinate its activities with other agricultural organizations.

Directly and through the Wild Blueberry Advisory Committee, the Commission works with and supports the University of Maine research and extension capabilities. The Commission and industry members are active participants on University of Maine System Board of Agriculture. The Commission's Executive Director is currently the chair of the Board of Agriculture.

The Commission has also supported Maine Agriculture in the Classroom programs believing that part of the success of Maine Agriculture depends on its future adult citizens understanding the positive contribution agriculture makes to the Maine environment and economy. The Commission's executive director has served on the Maine Agriculture in the Classroom Council helping to establish the programs

and decision making process of that council. Currently the executive director also serves as chair of the council.

Alternative Delivery Systems

The Wild Blueberry Commission of Maine with the support of the Legislature adopted an alternative delivery system when it became a public instrumentality of the State on July 1, 1997. Being an instrumentality allows the Commission to move faster on behalf of Maine's Wild Blueberry growers and processors. This organizational structure appears to be working well and as such a change is currently not under consideration.

For 30 years the Commission has accomplished Wild Blueberry promotion through the Wild Blueberry Association of North America. In recent years the Commission has partnered with Maine Agricultural in the Classroom to assist in its education out reach efforts. The Commission has a tradition of looking for ways to accomplish objectives through "alternative delivery systems" and working with other entities.

Regulations

Currently, the Wild Blueberry Commission does not have regulatory rules. However, it does issue Wild Blueberry transport permits to assist the growers in reducing field theft. This is the only paperwork that is required of the public and is limited strictly to Wild Blueberry growers. The permits are issued annually as per authority granted by the Legislature, Title 36, section 4315. Approximately 900 transportation permits are issued annually.

Compliance With Health and Safety Laws

The Commission strives to comply with all health and safety laws.

Collection of Personal Information

The only personal information the Commission collects on a regular basis is information provided on the "Maine Wild Blueberry Transport Permit" form. Personal information generated includes landowner name, address, phone number, permit holder's name, driver's license number, state of license issue, vehicle license plate number and state or province, and the location and phone number of the entity receiving the wild blueberries. This information is collected on paper forms. All this information is kept confidential as per Title 36, Chapter 701, section 4315 unless it is need to enforce the provisions of Title 36, Chapter 701, section 4314 or in prosecution of any other criminal law.

Figure 1

WILD BLUEBERRY COMMISSION OF MAINE
Organizational Chart

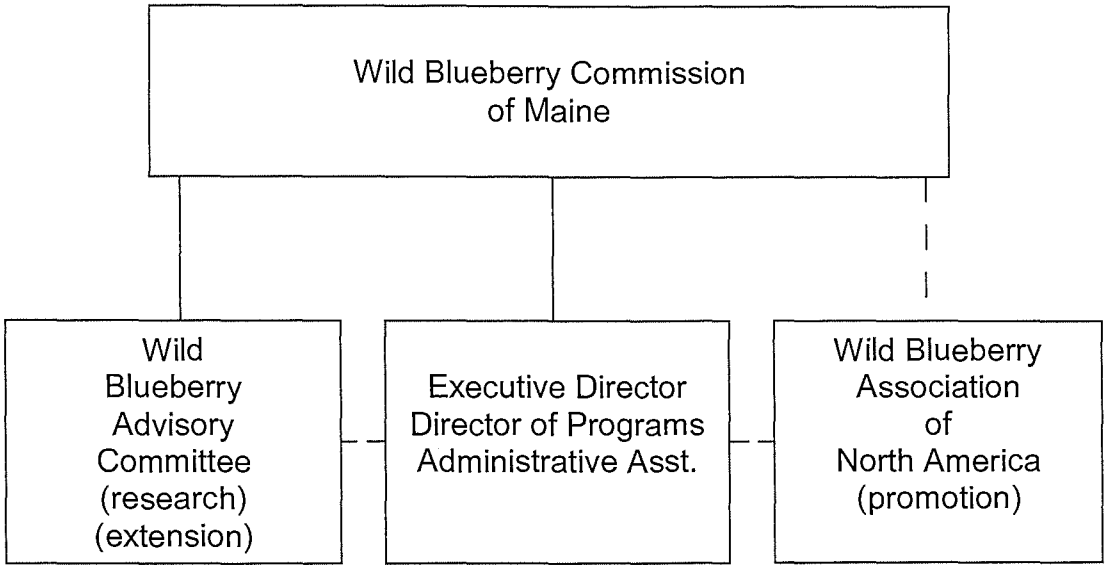


Figure 2

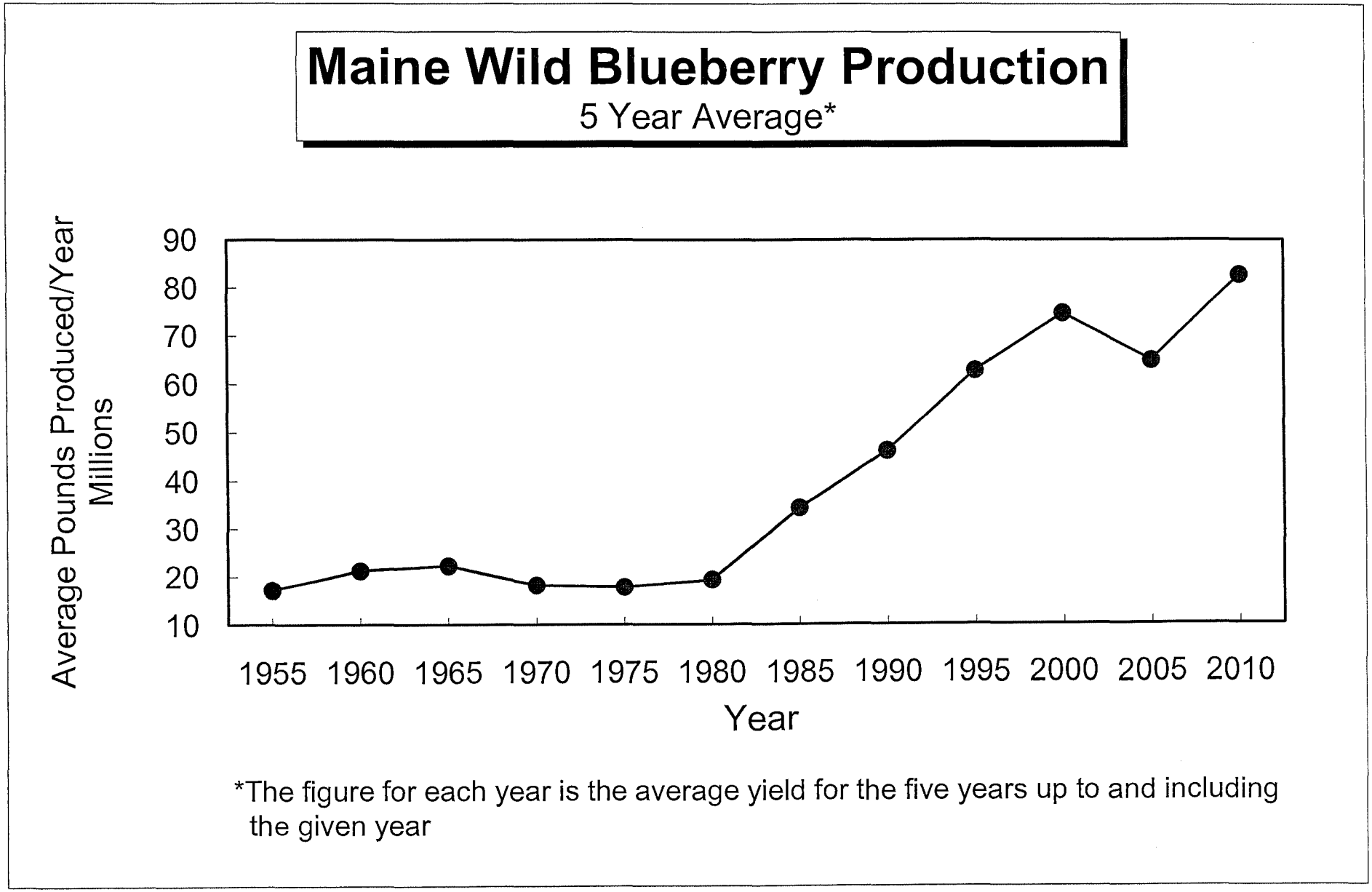
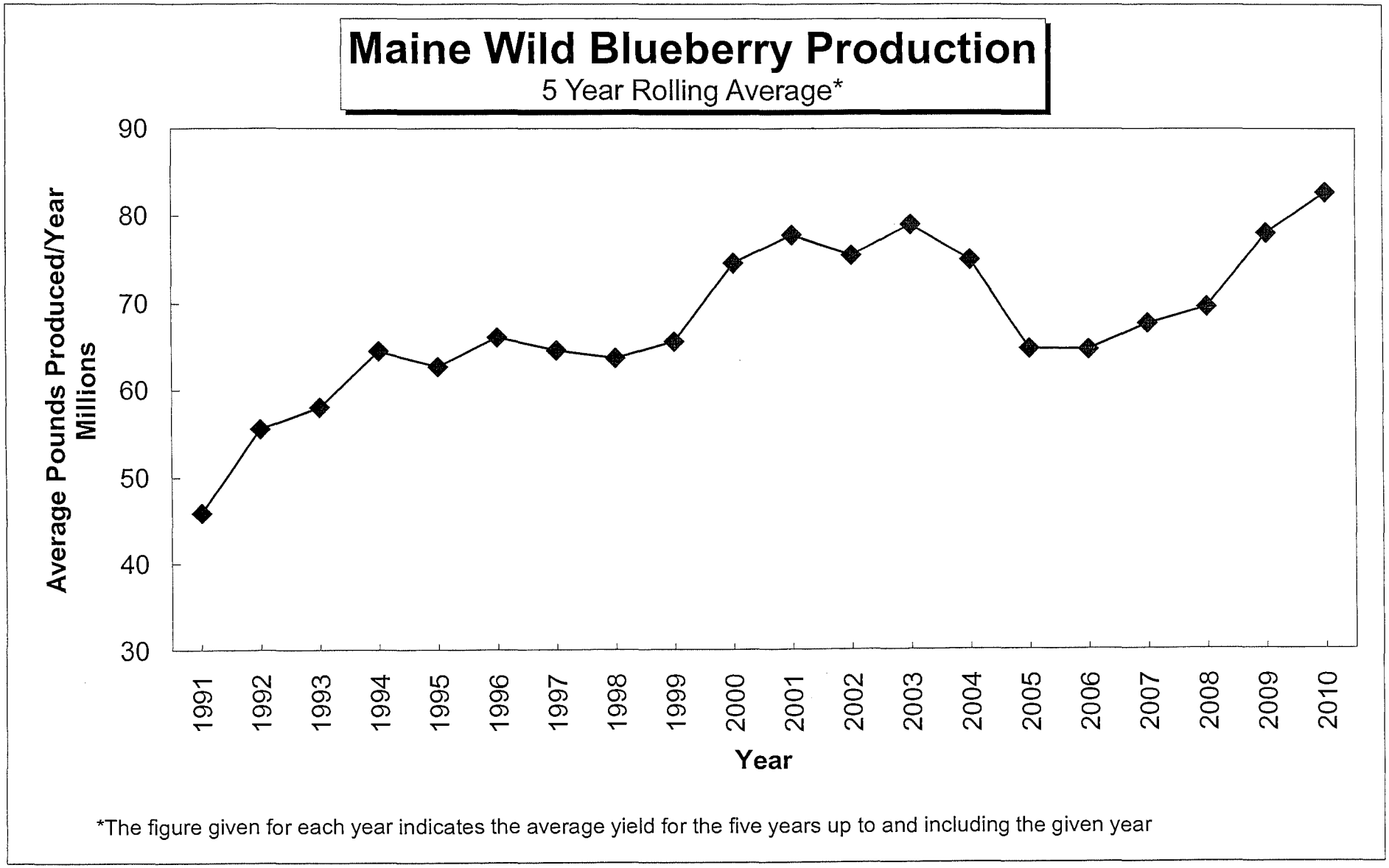

Maine Wild Blueberry Production
5 Year Average*
Average Pounds Produced/Year
Millions
90
80
70
60
50
40
30
20
10
1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010
Year
*The figure for each year is the average yield for the five years up to and including the given year

Figure 3



*The figure given for each year indicates the average yield for the five years up to and including the given year

Figure 4

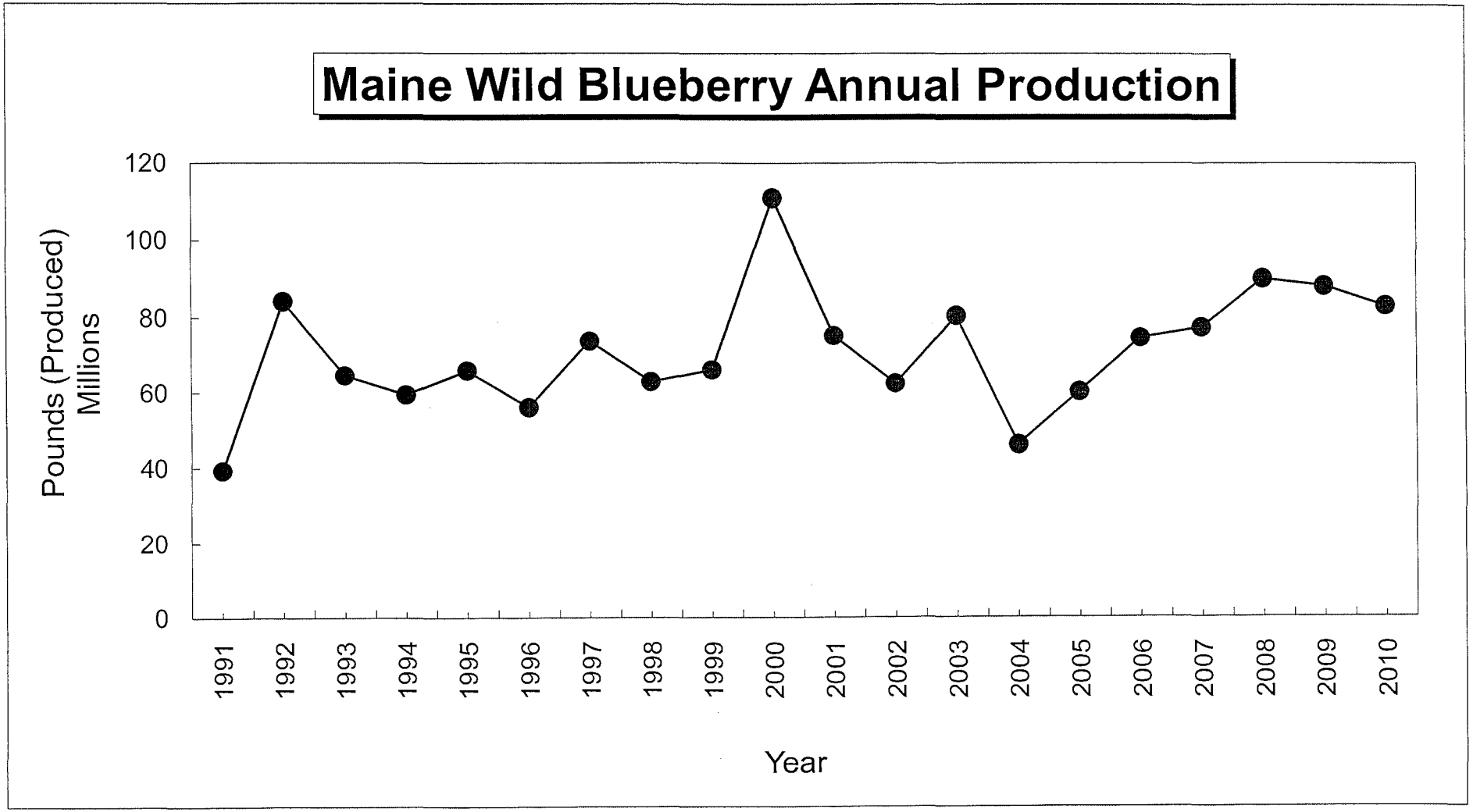
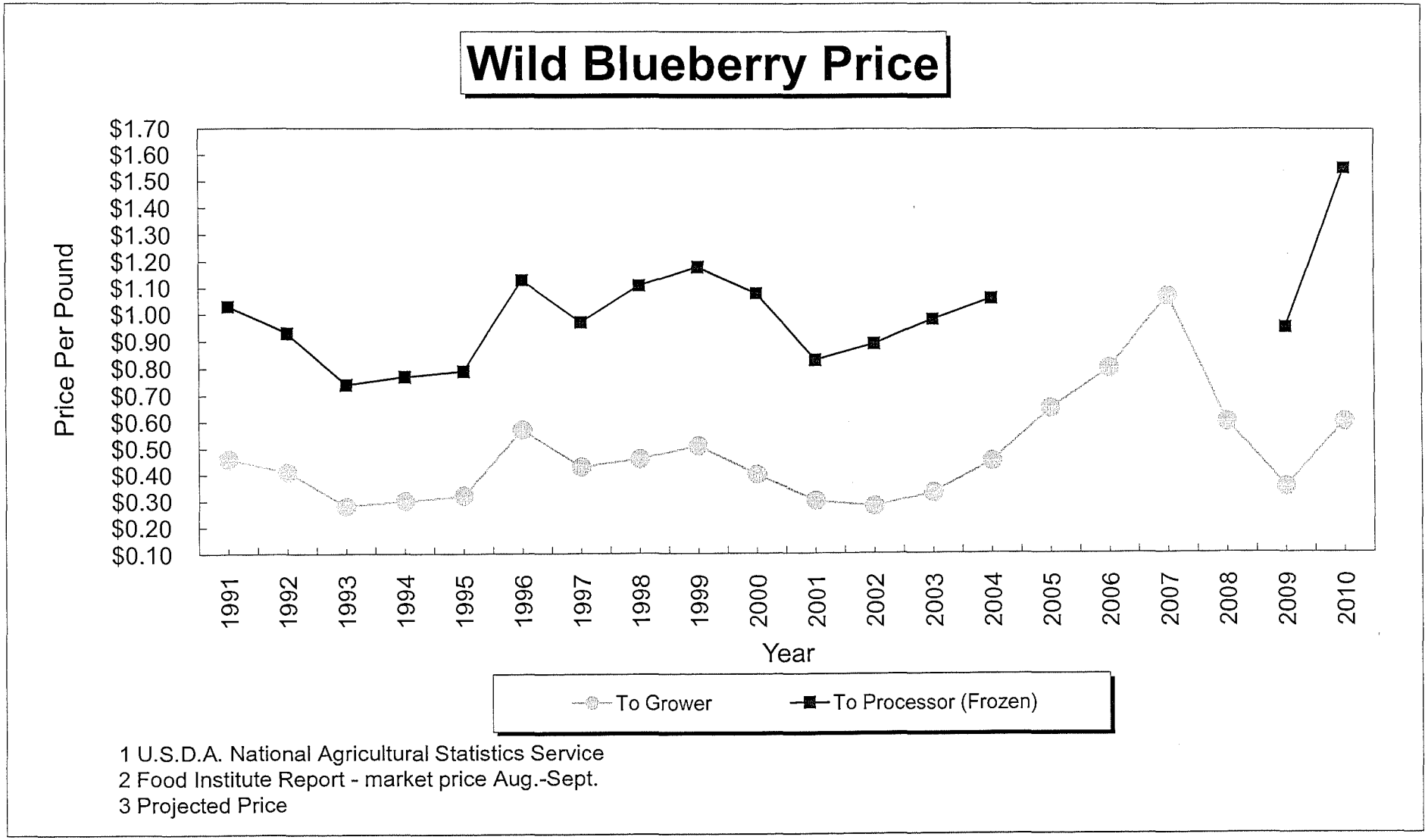
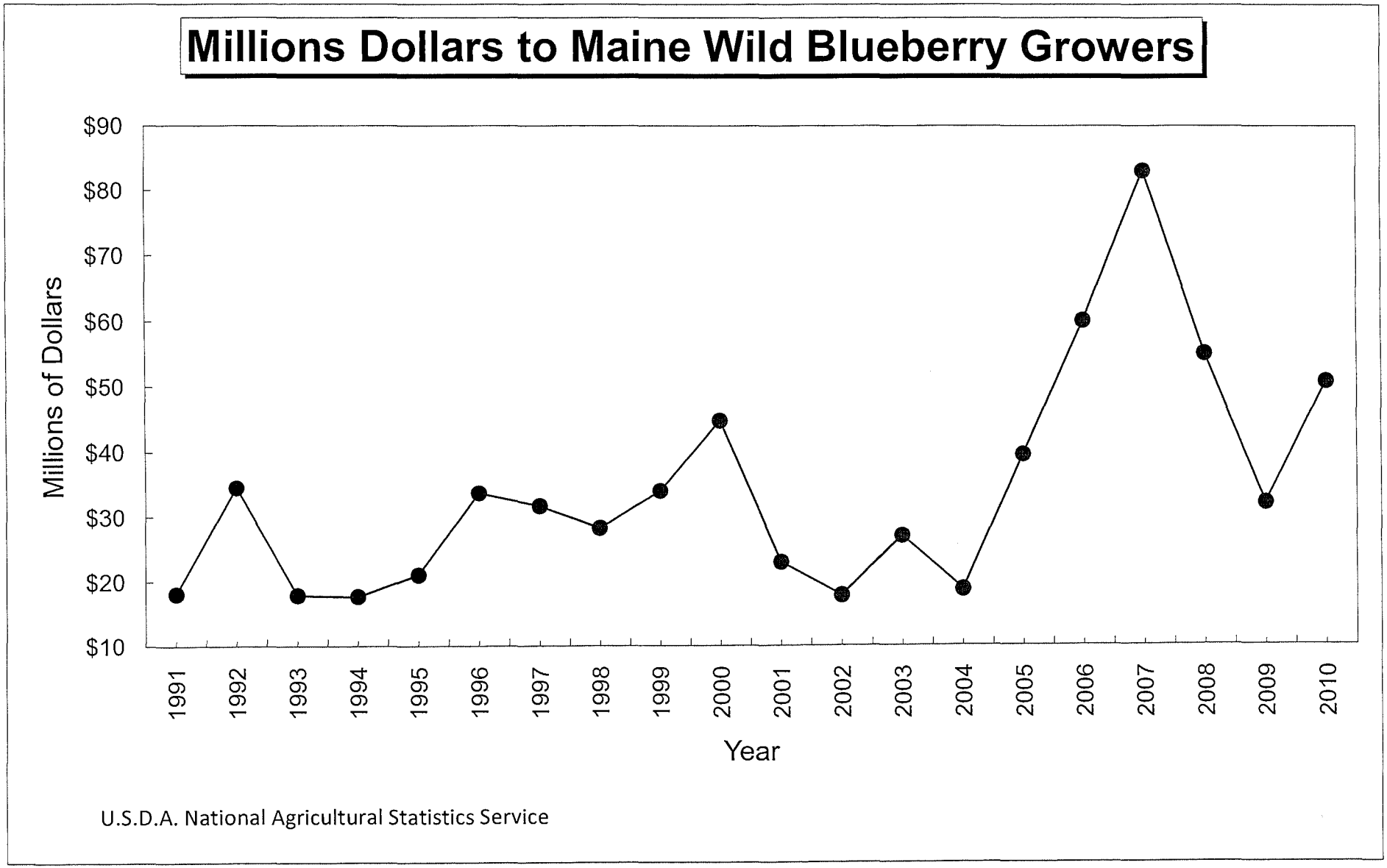

Maine Wild Blueberry Annual Production
Pounds (Produced)
Millions
120
100
80
60
40
20
0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year

Figure 5



1 U.S.D.A. National Agricultural Statistics Service
2 Food Institute Report - market price Aug.-Sept.
3 Projected Price

Figure 6


Millions Dollars to Maine Wild Blueberry Growers
$90
$80
$70
$60
$50
$40
$30
$20
$10
Millions of Dollars
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
U.S.D.A. National Agricultural Statistics Service

Maine Revised Statute Title 36, Chapter 701: BLUEBERRY TAX

Table of Contents

36 §4301. PURPOSE

The production and marketing of wild blueberries is one of the most important agricultural industries of the State, and this chapter is enacted into law to conserve and promote the prosperity and welfare of this State and of the wild blueberry industry of this State by fostering research and extension programs, by supporting the development of promotional opportunities and other activities related to the wild blueberry industry.
[1997, c. 511, §3 (AMD).]

SECTION HISTORY
1983, c. 836, §1 (AMD). 1997, c. 511, §3 (AMD).

36 §4302. DEFINITIONS

The terms used in this chapter shall be construed as follows:

1. Blueberries.

[1997, c. 511, §4 (RP) .]

1-A. Grower. "Grower" means a person, firm, partnership, association or corporation engaged in the growing of wild blueberries and that is not a "processor" as defined in subsection 2.

[1997, c. 511, §5 (AMD) .]

1-B. Crew leader. "Crew leader" means a person designated by an owner to supervise an organized crew.

[1989, c. 214, §1 (NEW) .]

1-C. Organized crew. "Organized crew" means a group of people working together under the supervision of a crew leader to harvest, pick, rake, possess or remove wild blueberries from the land of an owner.

[1997, c. 511, §6 (AMD) .]

1-D. Owner. "Owner" includes a landowner or leaseholder of land on which wild blueberries are grown and harvested for profit, or the landowner's or leaseholder's authorized agent, and includes a receiver of wild blueberries grown in Canada and purchased from Canadian sellers.

[1997, c. 511, §6 (AMD) .]

1-E. Permanent record. "Permanent record" means a written record which is kept and maintained for not less than 6 years.

[1989, c. 214, §1 (NEW) .]

1-F. First hauler. "First hauler" means a person, firm, partnership, association or corporation engaged in the transportation of wild blueberries from the field where the berries were harvested.

[2007, c. 694, §4 (NEW) .]

2. Processor. "Processor" means a person, firm, partnership, association or corporation engaged in the fresh packing, canning, freezing or dehydrating of wild blueberries whether as owner, agent or otherwise.

[1997, c. 511, §7 (AMD) .]

3. Seller. "Seller" means a person, firm, partnership, association or corporation offering fresh wild blueberries for sale, either to themselves or to others.

[1997, c. 511, §8 (AMD) .]

4. Shipper. "Shipper" means a person, firm, partnership, association or corporation engaged in the shipping, transporting, storing, selling or otherwise handling of wild blueberries either in processed form or as fresh fruit, whether as owner, agent or otherwise.

[1997, c. 511, §8 (AMD) .]

5. Transportation permit. "Transportation permit" means an official permit on forms duly adopted and furnished by the Wild Blueberry Commission of Maine to owners.

[1997, c. 511, §9 (AMD) .]

6. Wild blueberries. "Wild blueberries" means all lowbush blueberries grown, purchased, sold or handled for commercial purposes in this State.

[1997, c. 511, §10 (NEW) .]

SECTION HISTORY
1983, c. 836, §2 (AMD). 1989, c. 29, §1 (AMD). 1989, c. 214, §1 (AMD).
1997, c. 511, §§4-10 (AMD). 2007, c. 694, §4 (AMD).

36 §4303. RATE OF TAX

There is levied and imposed a tax at the rate of 3/4¢ per pound of fresh fruit on all fresh wild blueberries grown, purchased, sold, handled or processed in this State. The tax is computed on a fresh fruit basis, regardless of how the wild blueberries are processed. [2001, c. 147, §1 (AMD).]

SECTION HISTORY
1977, c. 533, §1 (AMD). 1979, c. 392, §1 (AMD). 1983, c. 836, §3 (AMD).
1989, c. 29, §2 (AMD). 1997, c. 511, §11 (AMD). 2001, c. 147, §1 (AMD).

36 §4303-A. ADDITIONAL TAX

There is levied and imposed an additional tax at the rate of 3/4¢ per pound of fresh fruit on all fresh wild blueberries grown, purchased, sold, handled or processed in this State. The tax is computed on a fresh fruit basis, regardless of how the berries are processed, and may not be deducted from the purchase price or collected from the seller under section 4306. [2001, c. 147, §2 (AMD).]

SECTION HISTORY
1971, c. 425, §1 (NEW). 1979, c. 392, §2 (AMD). 1983, c. 836, §4 (AMD).
1989, c. 29, §3 (AMD). 1997, c. 511, §12 (AMD). 2001, c. 147, §2 (AMD).

36 §4304. DUE DATE

The tax imposed by section 4303 and the additional tax imposed by section 4303-A are due upon any particular lot or quantity of wild blueberries under section 4307. [1997, c. 511, §13 (AMD).]

SECTION HISTORY
1971, c. 425, §2 (AMD). 1997, c. 511, §13 (AMD).

36 §4305. CERTIFICATION

1. Certification required. A processor or shipper of wild blueberries shall obtain certification from the assessor before processing or shipping wild blueberries. The assessor shall provide the applications for the certification, which must contain the name under which the processor or shipper is transacting business in the State, the place or places of business, the names and addresses of the persons constituting a firm, company or partnership and, if a corporation, the corporate name and names and addresses of its principal officers and agents in the State. A processor or shipper may not process or ship wild blueberries until the certification has been issued.

[2007, c. 694, §5 (NEW) .]

2. Violation; failure to obtain certification. A processor or shipper who fails to obtain certification under subsection 1 commits a civil violation for which a fine of not more than $5,000 may be adjudged.

[2007, c. 694, §5 (NEW) .]

3. Discretionary suspension or revocation. The assessor may suspend or revoke certification for:

A. Failure to pay the tax imposed by section 4303 or 4303-A; [2007, c. 694, §5 (NEW).]

B. Filing false or fraudulent reports or returns; or [2007, c. 694, §5 (NEW).]

C. Failure to comply with section 4315 or 4316. [2007, c. 694, §5 (NEW).]

[2007, c. 694, §5 (NEW) .]

4. Mandatory suspension or revocation. Upon notification by the Wild Blueberry Commission of Maine, a state agency or a state, county or local law enforcement agency, the assessor shall suspend or revoke certification of a processor or shipper who is convicted under section 4316, subsection 3-A. A person convicted under section 4316, subsection 3-A whose certification has been suspended under this subsection may not obtain a new certification from the assessor for 5 years from the date of the conviction. A firm, company, partnership, association or corporation that has one or more owners, officers or employees who have been convicted under section 4316, subsection 3-A may not obtain certification from the assessor for 5 years from the date of any such conviction. The assessor may determine that an owner, officer or employee has not been convicted under section 4316, subsection 3-A if an applicant for certification submits a notarized statement attesting that none of the applicant's owners, officers or employees has been convicted under section 4316, subsection 3-A in the prior 5 years.

[2007, c. 694, §5 (NEW) .]

5. Certificate not license. A certificate issued by the assessor pursuant to this section is not a license within the meaning of that term in the Maine Administrative Procedure Act.

[2007, c. 694, §5 (NEW) .]

SECTION HISTORY
1977, c. 694, §711 (RPR). 1995, c. 639, §14 (AMD). 1997, c. 511, §14 (AMD). 2003, c. 705, §5 (AMD). 2007, c. 694, §5 (RPR).

36 §4306. TAX DEDUCTED FROM PURCHASE PRICE

Each processor or shipper purchasing wild blueberries and paying or becoming liable to pay the tax imposed by section 4303 shall charge and collect from the seller a tax at the rate of 3/4¢ per pound, to be deducted from the purchase price of all wild blueberries subject to the tax purchased by the processor or shipper. [2001, c. 147, §3 (AMD).]

SECTION HISTORY
1977, c. 533, §2 (AMD). 1979, c. 392, §3 (AMD). 1983, c. 836, §5 (AMD). 1997, c. 511, §15 (AMD). 2001, c. 147, §3 (AMD).

36 §4307. RECORDS AND REPORTS; PAYMENT OF TAX

Every processor or shipper shall, on or before November 1st of each year, report to the State Tax Assessor the quantity of wild blueberries grown, purchased or sold by that processor or shipper during the current season, on forms furnished by the State Tax Assessor. The report must contain the information pertinent to the purchase or sale as the State Tax Assessor prescribes. With the report, each processor or shipper shall forward payment of the tax at the rate of 1 1/2¢ per pound upon all wild blueberries reported as grown, sold or purchased. [2001, c. 147, §4 (AMD).]

SECTION HISTORY
1971, c. 425, §3 (AMD). 1977, c. 533, §3 (AMD). 1979, c. 378, §28 (AMD). 1979, c. 392, §4 (AMD). 1981, c. 364, §44 (AMD). 1983, c. 836, §6 (AMD). 1997, c. 511, §16 (AMD). 2001, c. 147, §4 (AMD).

36 §4308. INSPECTION

The State Tax Assessor or the assessor's duly authorized agents have authority to enter any place of business of any processor or shipper or any car, boat, truck or other conveyance in which wild blueberries are to be transported and to inspect any books or records of any processor or shipper, or any premises where wild blueberries are stored, handled, transported or merchandised, for the purpose of determining what wild blueberries are taxable under this chapter or for the purpose of determining the truth or falsity of any statement or return made by any processor or shipper, and the State Tax Assessor may delegate that power to the Commissioner of Agriculture, Food and Rural Resources, or the commissioner's deputies, agents or employees. [1997, c. 511, §17 (AMD).]

SECTION HISTORY
1979, c. 731, §19 (AMD). 1997, c. 511, §17 (AMD).

36 §4309. RECORDS AVAILABLE ON LIMITED BASIS

(REPEALED)

SECTION HISTORY
1977, c. 668, §4 (RP).

36 §4310. FALSE RETURNS; VIOLATIONS; CIVIL ACTION FOR COLLECTION

(REPEALED)

SECTION HISTORY
1973, c. 6, (AMD). 1977, c. 679, §27 (AMD). 1981, c. 364, §45 (RP).

36 §4311. APPROPRIATION OF MONEYS RECEIVED

(REPEALED)

SECTION HISTORY
1971, c. 425, §4 (AMD). 1977, c. 533, §§4,5 (AMD). 1983, c. 836, §7 (RP).

36 §4311-A. APPROPRIATIONS OF MONEY RECEIVED

Money received from the tax levied by sections 4303 and 4303-A must be appropriated for the following purposes: [1997, c. 511, §18 (AMD).]

1. Collection and enforcement. The commission shall pay a sum to the State Tax Assessor representing the cost incurred by the State in collection of the taxes imposed by this chapter and the enforcement of this chapter;

[1997, c. 511, §18 (AMD) .]

1-A. Transfer, allocation and appropriation. Money received by the Treasurer of State under this chapter, including all receipts of taxes levied under sections 4303 and 4303-A, must be transferred to the Wild Blueberry Commission of Maine in its capacity as an independent agency on a monthly basis by the 15th of the month following collection and be used for all activities of the commission authorized under this chapter. All money received by the Treasurer of State under this chapter, including all receipts of taxes levied under sections 4303 and 4303-A, must be allocated or appropriated to the commission by the Legislature. Money received by the commission does not lapse and may be invested until expended for activities authorized under this chapter;

[1997, c. 511, §18 (NEW) .]

2. Promotion and advertising. The Wild Blueberry Commission of Maine may implement programs and activities to promote and advertise wild blueberries; and join with any local, state, federal or private agency, department, firm, corporation or association to implement the purposes of this section;

[1997, c. 511, §18 (AMD) .]

3. Research and extension educational programs. Thirty percent of the funds collected, but not to exceed $85,000, must be dedicated to the University of Maine System for the purpose of supplementing its research and extension programs related to improved methods of growing, harvesting, processing, product development and marketing of wild blueberries. The Wild Blueberry Commission of Maine may allocate additional funds to the University of Maine System or other organizations for research and extension programs as may be appropriate to implement the purposes of this section;

[1997, c. 511, §18 (AMD) .]

4. Administration and other activities. The commission may allocate funds necessary for the administration of this chapter and for other activities related to the economic viability of the Maine wild blueberry industry; and

[1997, c. 511, §18 (AMD) .]

5. Balance of funds. Any funds remaining over and above the expenses incurred under subsection 3 do not lapse, but must be carried forward to the same fund and for the same purposes for the next fiscal year.

[1997, c. 511, §18 (AMD) .]

SECTION HISTORY

1983, c. 836, §8 (NEW). 1985, c. 779, §81 (AMD). 1997, c. 511, §18 (AMD).

36 §4312. ADVISORY COMMITTEE

The University of Maine System Wild Blueberry Advisory Committee, as authorized by Title 5, chapter 379, is appointed by the Wild Blueberry Commission of Maine. The committee consists of 7 members who are active in and representative of the wild blueberry industry. The duty of the committee is to advise and work with the University of Maine System to develop and approve a plan of work and budgets for research and extension programs related to the production and use of wild blueberries. [1997, c. 511, §19 (AMD).]

Current members of the advisory committee shall continue to serve for the duration of their current appointments. New appointments to the advisory committee shall be for terms of 4 years and no appointee may be eligible for reappointment until the lapse of one year from the expiration of a previous appointment. [1983, c. 836, §9 (NEW).]

SECTION HISTORY
1977, c. 533, §6 (AMD). 1983, c. 836, §9 (RPR). 1985, c. 75, (AMD). 1985, c. 295, §55 (AMD). 1985, c. 737, §A99 (AMD). 1985, c. 779, §82 (AMD). 1987, c. 402, §A186 (AMD). 1989, c. 503, §B166 (AMD). 1997, c. 511, §19 (AMD).

36 §4312-A. APPROPRIATION OF MONEYS RECEIVED

(REPEALED)

SECTION HISTORY
1971, c. 425, §5 (NEW). 1977, c. 533, §7 (AMD). 1989, c. 29, §4 (RP).

36 §4312-B. MAINE BLUEBERRY COMMISSION

(REPEALED)

SECTION HISTORY
1971, c. 425, §5 (NEW). 1977, c. 533, §8 (RPR). 1983, c. 812, §272 (AMD). 1983, c. 836, §10 (RPR). 1985, c. 737, §A100 (RPR). P&SL 1987, c. 130, (AMD). 1989, c. 503, §B167 (AMD). 1995, c. 331, §2 (AMD). 1997, c. 511, §20 (RP).

36 §4312-C. WILD BLUEBERRY COMMISSION OF MAINE

1. Commission established as a public instrumentality. The Wild Blueberry Commission of Maine, as established by Title 5, section 12004-H, subsection 13-A and referred to in this section as the "commission," is established as a public body corporate and politic and an incorporated public instrumentality of the State. The exercise of powers conferred by this chapter is held to be the performance of essential government functions.

A. Employees of the commission may not be construed to be state employees for any purpose, including the state civil service provisions of Title 5, Part 2 and Title 5, chapter 372. [1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF).]

B. The commission may not be construed to be a state agency for any purpose, including the budget, accounts and control, auditing, purchasing or other provisions of Title 5, Part 4. [1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF).]

C. Notwithstanding paragraphs A and B:

(1) Employees of the commission may be state employees for the purposes of the state retirement provisions of Title 5, Part 20 and the state employee health insurance program under Title 5, chapter 13, subchapter II;

(2) For the purposes of the Maine Tort Claims Act, the commission is a governmental entity and its employees and members are employees as those terms are defined in Title 14, section 8102;

(3) Funds received by the commission pursuant to this chapter must be allocated to the commission by the Legislature in accordance with Title 5, section 1673; and

(4) All meetings and records of the commission are subject to the provisions of Title 1, chapter 13, subchapter I, except that by majority vote of those members present, records and meetings of the commission may be closed to the public when public disclosure of the subject matter of the records or meetings would adversely affect the competitive position of the wild blueberry industry of the State or segments of that industry. The Commissioner of Agriculture, Food and Rural Resources and those members of the Legislature appointed to serve on the joint standing committee of the Legislature having jurisdiction over agricultural, conservation and forestry matters have access to all material designated confidential by the commission.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

2. Appointment. Appointments to the commission are made by the Commissioner of Agriculture, Food and Rural Resources.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

3. Membership. The commission consists of 8 members who are active in and representative of the wild blueberry industry, appointed by the Commissioner of Agriculture, Food and Rural Resources. Three members must be grower representatives. For the purposes of this section, "grower" means a person, firm, partnership, association or corporation engaged in the growing of wild blueberries and processing less than 1,000,000 pounds of wild blueberries in a calendar year. Five members must be processor representatives who process 1,000,000 pounds or more of wild blueberries in a calendar year.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

4. Term. Members serve 4-year terms.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

5. Organization. Members of the commission shall elect annually by majority vote one member of the commission to serve as chair and one member to serve as vice-chair. The commission may appoint by majority vote an executive director who is the commission's chief administrator and such personnel as the commission considers necessary to administer policies and programs established by the commission. The executive director and other staff serve at the pleasure of the commission. The salaries paid to the executive director and other staff of the commission are fixed by the commission. The executive director and other staff are not subject to the personnel laws of the State.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

6. Compensation of commissioners. Members of the commission are entitled to compensation in accordance with Title 5, chapter 379.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

7. Function of commission. It is the responsibility of the commission to utilize and allocate such funds as may be available from the funds collected under section 4307. The commission may make contracts or enter into contracts with any local, state, federal or private agency, department, firm, corporation or association as may be necessary to carry out the purposes of this chapter.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

8. Debt. A debt or obligation incurred by the commission is not a debt or obligation of the State.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

9. Books and records. The commission shall keep books, records and accounts of all its activities, which must be open to inspection and audit by the State at all times. An independent certified public accountant shall conduct an annual audit of the financial records of the commission and report the results of the audit to the commission, the Commissioner of Agriculture, Food and Rural Resources, the Treasurer of State and the Legislature.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

10. Funding. The commission may receive and expend funds from any source, public or private, that it determines necessary to carry out its purposes.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

11. Appropriation and use of money received. The commission may accept grants or contributions of money or other things of value from any source, public or private. Those grants or other contributions must be held by the commission and used to carry out the purposes of this chapter, subject to any condition under which the grant or contribution was accepted by the commission.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

12. Bylaws. The commission may adopt bylaws to govern its functions.

[1997, c. 511, §21 (NEW); 1997, c. 511, §25 (AFF) .]

SECTION HISTORY
1997, c. 511, §21 (NEW). 1997, c. 511, §21 (NEW). 1997, c. 511, §25 (AFF). 1997, c. 511, §25 (AFF).

36 §4313. TAX AS ADDITIONAL

(REPEALED)

SECTION HISTORY
1981, c. 364, §46 (RP).

36 §4314. PERMIT REQUIRED

1. Possession or removal unlawful. It is unlawful for a person to harvest, pick, rake, possess or remove wild blueberries from the land of an owner without first securing written permission from the owner or the owner's authorized agent. This section does not apply to members of an organized crew, if the crew leader has first secured the written permission of the owner. The written permission must identify the land by reference to tax map, lot number and town, township or plantation or to global positioning coordinates for the area where wild blueberries are managed. A person authorized to make inspections under this chapter may require

a person on the land of an owner who has possession of wild blueberries or is found harvesting, raking, picking or removing wild blueberries to show valid written permission. Violation of this subsection is a strict liability crime as defined in Title 17-A, section 34, subsection 4-A.

[2007, c. 694, §6 (AMD) .]

2. No effect on other laws. Nothing in this section may be construed:

A. To relieve any person of any obligation to obtain permission to enter upon the land or premises of another; or [1989, c. 214, §2 (NEW).]

B. To affect any criminal or civil liability which may exist for unauthorized entry, trespass, theft or conversion. [1989, c. 214, §2 (NEW).]

[1989, c. 214, §2 (NEW) .]

3. Violation; first offense. A person who violates subsection 1 commits a Class E crime.

[2007, c. 694, §7 (RPR) .]

4. Violation; subsequent offenses. A person who violates subsection 1 when the person has 2 prior convictions for violation of subsection 1 commits a Class D crime. Title 17-A, section 9-A governs the use of prior convictions when determining a sentence.

[2007, c. 694, §8 (NEW) .]

SECTION HISTORY
1989, c. 214, §2 (NEW). 1997, c. 511, §22 (AMD). 2007, c. 694, §§6-8 (AMD).

36 §4315. TRANSPORTATION OF WILD BLUEBERRIES

1. Transportation of wild blueberries; permit required. A person may not transport wild blueberries in quantities exceeding 25 pounds without first obtaining a transportation permit on an official form to be furnished by the Wild Blueberry Commission of Maine. The Wild Blueberry Commission of Maine shall issue upon request uniquely numbered transportation permit forms to owners. Owners shall issue the transportation permits to first haulers or shippers who transport wild blueberries directly from the field from which the wild blueberries were harvested. Each transportation permit issued automatically expires on the 30th of September in the year in which it was issued. This subsection does not apply to wild blueberries that have been received by a certified shipper or processor and have been weighed, logged into a permanent record-keeping system and reloaded onto a vehicle for shipping under a bill of lading.

[2007, c. 694, §9 (AMD) .]

1-A. Records of permits; confidentiality. When an owner issues a transportation permit, the owner shall send a copy to the Wild Blueberry Commission of Maine within 3 business days of the date of issuance. The commission shall keep a permanent record of all transportation permits issued. The commission shall establish the form and content of transportation permits and establish the record-keeping requirements for the commission and owners. Notwithstanding any provision of Title 1, chapter 13, subchapter 1 to the contrary, records pertaining to transportation permits required to be kept by the Wild Blueberry Commission of Maine under this section are confidential to the extent necessary to preserve the identity of parties to individual business transactions. The confidential status does not apply when records kept by the Wild Blueberry Commission of Maine are needed as evidence in a proceeding to enforce the provisions of this chapter or in a prosecution for a violation of any other criminal law.

[2007, c. 694, §9 (AMD) .]

1-B. Restrictions on first haulers. A first hauler who is not certified as a shipper may not transport berries from the field to any entity other than a shipper or a processor holding a valid certification under section 4305.

[2007, c. 694, §9 (NEW) .]

2. Permits subject to forgery laws. Every permit specified under this section is deemed to be a written instrument subject to the laws of forgery.

[1989, c. 214, §2 (NEW) .]

3. Violation. The following penalties apply to violations of this section.

A. Except as provided in subsection 4, a person who transports wild blueberries in violation of this section commits :

(1) A Class E crime; or

(2) A Class D crime if the person has 2 or more prior convictions under this paragraph.

A violation under this paragraph is a strict liability crime as defined in Title 17-A, section 34, subsection 4-A. [2007, c. 694, §9 (AMD).]

B. A person who violates any other provision of this section commits a civil violation for which a fine of not more than $1,000 may be adjudged. [2007, c. 694, §9 (AMD).]

[2007, c. 694, §9 (AMD) .]

4. Exceptions. A person is not guilty of transporting wild blueberries without a transportation permit if:

A. The person is transporting wild blueberries that were not harvested in this State; [2007, c. 694, §9 (AMD).]

B. That person purchased the wild blueberries at a store, farm stand, produce market or other retail outlet; or [2007, c. 694, §9 (AMD).]

C. That person is an owner transporting less than 100 pounds of wild blueberries harvested from the owner's own land to the owner's residence for personal use. [2007, c. 694, §9 (NEW).]

[2007, c. 694, §9 (AMD) .]

SECTION HISTORY
1989, c. 214, §2 (NEW). 1989, c. 859, §1 (AMD). 1997, c. 511, §23 (AMD). 1999, c. 194, §1 (AMD). 2003, c. 452, §§U6-8 (AMD). 2003, c. 452, §X2 (AFF). 2007, c. 694, §9 (AMD).

36 §4316. RECEIVERS OF WILD BLUEBERRIES

1. Record keeping required. A shipper or processor who transports or receives wild blueberries shall keep a permanent record of each lot or load of wild blueberries . The record must include the name of the driver of the vehicle used to deliver the wild blueberries, the date of delivery, the delivery point, a copy of the transportation permit, the driver's license number and the total pounds of wild blueberries delivered.

[2007, c. 694, §10 (AMD) .]

2. Inspection of permit required. It is unlawful for a shipper or processor to receive or accept delivery of wild blueberries without first inspecting the transportation permit of the driver of the vehicle used to deliver the wild blueberries and creating a permanent record in accordance with subsection 1.

[2007, c. 694, §10 (AMD) .]

3. Violation; civil. The failure to keep the permanent records of wild blueberries transported or received as required in this section, failure to inspect the transportation permit of a driver of a vehicle used to deliver wild blueberries or any other violation of this section is a civil violation punishable by a fine of not more than $5,000 for a first-time violation and punishable by a fine of not more than $10,000 when the person is found to have committed a prior civil violation of this section within the prior 5 years.

[2007, c. 694, §10 (AMD) .]

3-A. Violation; criminal. A shipper or processor who violates this section when the shipper or processor is found to have committed 2 prior civil violations of this section commits a Class D crime. Title 17-A, section 9-A governs the use of prior convictions when determining a sentence.

[2007, c. 694, §10 (NEW) .]

3-B. Strict liability crime. Violation of this section is a strict liability crime as defined in Title 17-A, section 34, subsection 4-A.

[2007, c. 694, §10 (NEW) .]

4. Audits. The Wild Blueberry Commission of Maine may request the Department of Agriculture, Food and Rural Resources to conduct audits of the records of shippers or processors for the purpose of ascertaining compliance with this section. The commissioner, or a duly authorized agent, has free access, during normal business hours, to all records required to be kept by shippers or processors pursuant to this section and also to shippers' or processors' accounts payable, accounts receivable, records of inventories, actual inventories, records of shipments and such other business records as are needed to ascertain compliance with this section. Any documents inspected or taken by the department in furtherance of the audit functions or any other information collected by the department pursuant to the audit must be kept confidential notwithstanding any provision to the contrary contained in Title 1, chapter 13, subchapter 1. This confidential status does not apply to any documents, records or information that is needed as evidence in any civil or criminal proceeding to enforce any law under this chapter or any other criminal law.

[2007, c. 694, §10 (AMD) .]

SECTION HISTORY
1989, c. 214, §2 (NEW). 1989, c. 859, §§2,3 (AMD). 1997, c. 511, §24 (AMD). 2007, c. 694, §10 (AMD).

36 §4317. AUTHORIZED LAW ENFORCEMENT

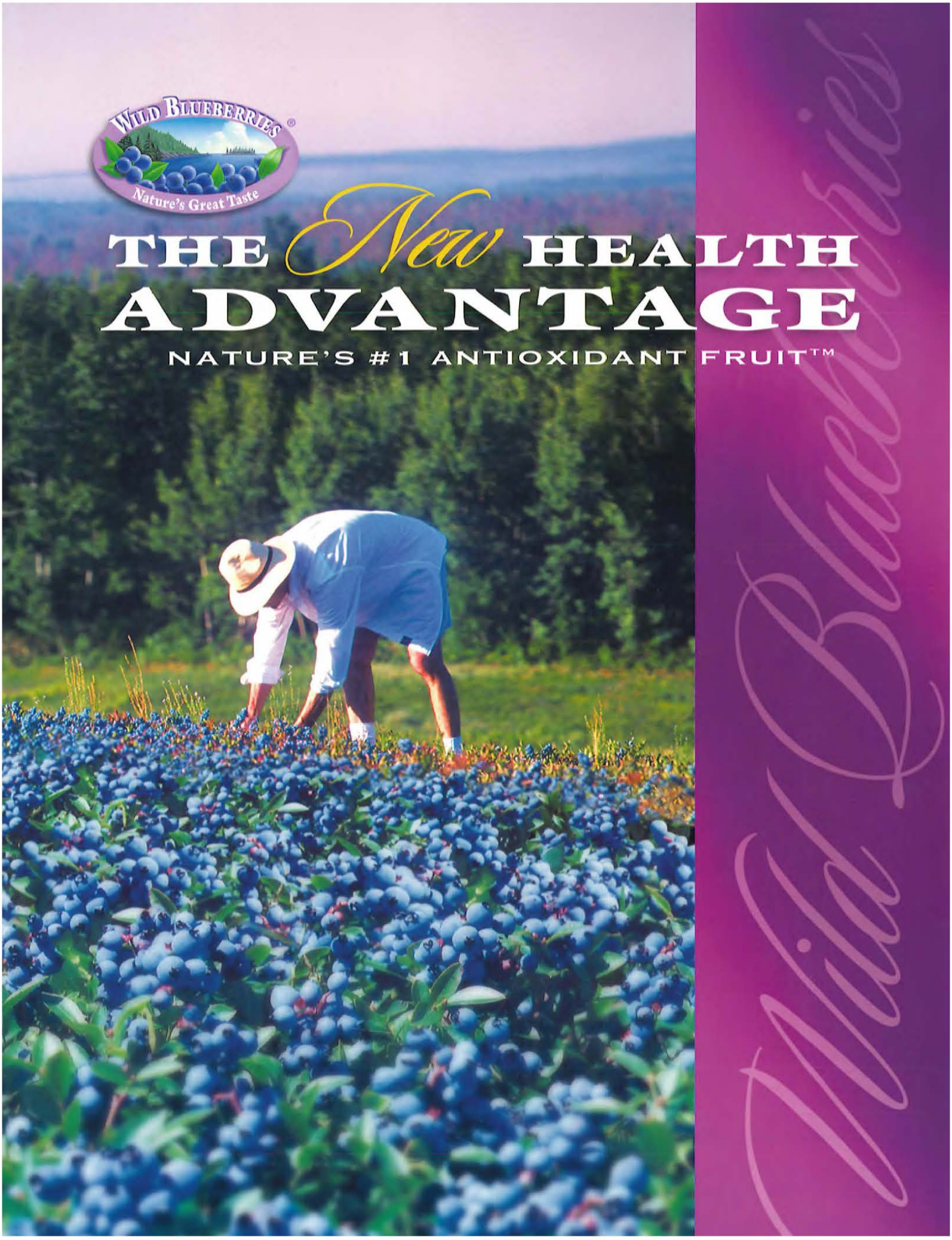
State police, county sheriffs and their deputies, municipal enforcement officers, state forest rangers and game wardens are authorized to make inspections, conduct investigations, make arrests and otherwise enforce this chapter. [1989, c. 214, §2 (NEW).]

SECTION HISTORY
1989, c. 214, §2 (NEW).

36 §4318. SUNSET PROVISION

(REPEALED)

SECTION HISTORY
1989, c. 214, §2 (NEW). 1991, c. 506, §6 (RP).


Wild Blueberries®
Nature's Great Taste
THE New HEALTH ADVANTAGE
NATURE'S #1 ANTIOXIDANT FRUIT™
Wild Blueberries

THE INGREDIENT

THE NEW HEALTH ADVANTAGE

Whether we're talking restaurant fare or packaged goods, bakery or beverage, one word describes today's hottest food trend: health. Consumers are choosing good-for-you foods that are great tasting and offer potential health benefits. Wild Blueberries are the ingredient that delivers both. Isn't it time to give your products a healthy advantage?

THINK BLUE, THINK HEALTHY

Satisfying your customers' demands for healthful products is easy: think Wild Blueberries. It turns out everybody's favorite little berry is also gaining fame as the most potent antioxidant fruit. In recent years, blueberries have turned up on numerous top-ten lists of superfoods, from *TIME, Health, Woman's Day* and *Cooking Light*, to *Oprah, CBS News* and the *Today Show.*

THAT SAYS *Healthy.*

As one food writer put it, Wild Blueberries are today's "it" health food. In fact, Wild Blueberries are packed with powerful, "blue" phytonutrients that promise a wide range of potential health benefits, from protecting against cancer and heart disease to keeping the brain sharp.

THE INGREDIENT OF CHOICE

Around the world, more Wild Blueberries are used as ingredients than any other blueberries on earth. It's no surprise, considering their natural advantages: a distinctive, tangy-sweet flavor, a smaller size that delivers more berries per pound, superior performance — in any form — and marketing appeal, thanks to their "wild mystique." Plus the fact that Wild Blueberries are antioxidant superstars, giving you all the ingredients for a healthy product success story.

JUST ADD WILD

Add great taste and a health halo to your products simply by using today's most exciting fruit ingredient: Wild Blueberries, the ingredient that says "healthy."

THE *Buzz* ABOUT WILD BLUEBERRIES

Consumer interest in Wild Blueberries has increased dramatically in recent years, thanks to the steady flow of good news surrounding this anti-aging superstar. Scientists, nutritionists and food editors alike are keeping the spotlight on blueberries and their potential health-promoting properties, dubbing them everything from "superfoods" to "brain berries," "power foods" to "miracle berries." No wonder everyone is buzzing about Wild Blueberries!

Nature's #1 ANT

"WILD BLUEBERRIES ARE STARS IN TERMS OF THEIR ANTIOXIDANT CAPACITY."
– DR. RONALD PRIOR, LEAD RESEARCHER AT THE USDA ARKANSAS CHILDREN'S NUTRITION CENTER AND AGRICULTURAL RESEARCH SERVICE

WILD BLUEBERRIES ARE #1 IN ANTIOXIDANTS

Recent USDA studies show that Wild Blueberries deliver a potent antioxidant punch — in fact, they have the highest antioxidant capacity per serving, compared with more than 20 other fruits.[1] Using a lab testing procedure called Oxygen Radical Absorbance Capacity (ORAC), USDA researcher Ronald Prior, Ph.D., found that a serving of Wild Blueberries had more total antioxidant capacity (TAC) than a serving of cranberries, strawberries, plums, raspberries and even cultivated blueberries. Simply put, this makes Wild Blueberries powerful allies in the quest for good health.

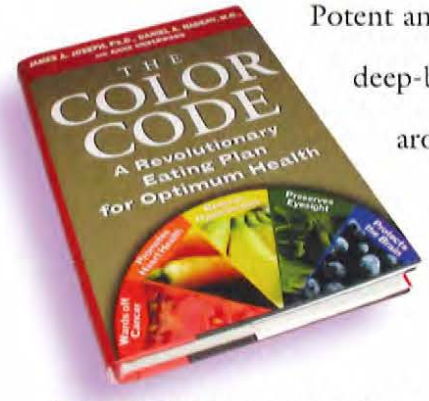
ANTIOXIDANTS FIGHT AGING, CANCER AND HEART DISEASE

Here's why antioxidants are such a hot topic today: they help our bodies protect against disease and age-related health risks. Every day, our cells wage a battle against free radicals — unstable oxygen molecules associated with cancer, heart disease and the effects of aging. Antioxidants come to the rescue. These phytonutrients, natural substances found in fruits and vegetables, neutralize free radicals and help prevent cell damage. Antioxidants also protect against inflammation, thought to be a leading factor in brain aging, Alzheimer's disease, and other diseases of aging.

[1] JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY, 2004, 52: 4026-4037

IOXIDANT FRUIT.™

HEALTHY AGING: THE POWER OF BLUE



DEEP-BLUE BLUEBERRIES MAY BE "ONE OF THE BEST AGE-PROOFING FOODS IN YOUR DIET," ACCORDING TO JAMES A. JOSEPH, PH.D., COAUTHOR OF THE COLOR CODE AND LEAD RESEARCHER AT THE USDA HUMAN NUTRITION RESEARCH CENTER ON AGING.

Potent antioxidants are highly concentrated in the deep-blue pigments of Wild Blueberries. Scientists around the world are studying the ways in which the antioxidant Power of Blue™ may help combat disease and promote healthy aging. The many potential health benefits of Wild Blueberries include:

- **Brain Health** Ongoing brain research shows that blueberries may improve motor skills and actually reverse the short-term memory loss that comes with aging.
- **Cancer Prevention** Research shows that blueberry compounds may inhibit all stages of cancer.
- **Heart Health** Research indicates that blueberries may protect against heart disease and damage from stroke.
- **Urinary Tract Health** Like cranberries, blueberries may help prevent urinary tract infections.
- **Vision Health** Research around the world has indicated that blueberries may improve night vision and prevent tired eyes.

PUT THE PYRAMID TO WORK FOR YOU

Eat more fruits and vegetables! That's the latest rallying cry from the USDA, found in the new *Dietary Guidelines for Americans 2005.* Consumers looking for delicious ways to get the recommended amount of fruit into their daily diets — 1 to 2½ cups — will find Wild Blueberries the ideal choice. Just ½ cup of Wild Blueberries delivers one fruit serving and is a good source of dietary fiber. It's a Daily Dose of Blue™ your customers will love.

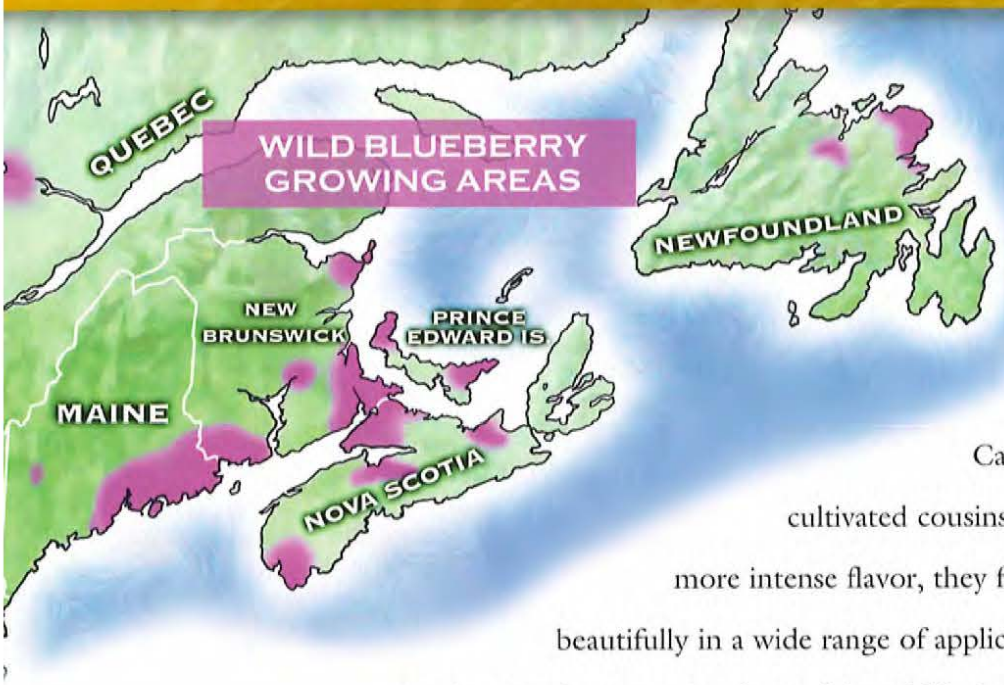
THINK *Health*, *Think* COLOR

Antioxidants and other beneficial phytonutrients are concentrated in the pigments of deeply colored fruits and vegetables — that's why color is the key to healthy eating. The National 5 A Day Partnership recommends eating a variety of colorful fruits and vegetables every day to get the full spectrum of vitamins, minerals and phytonutrients your body needs to stay healthy and energetic. As Dr. James Joseph, author of *The Color Code* says, "You can't go wrong if you fortify your diet with colorful foods… Think health, think color!"

5 A Day THE COLOR WAY™

When it comes to the color blue, think Wild Blueberries.

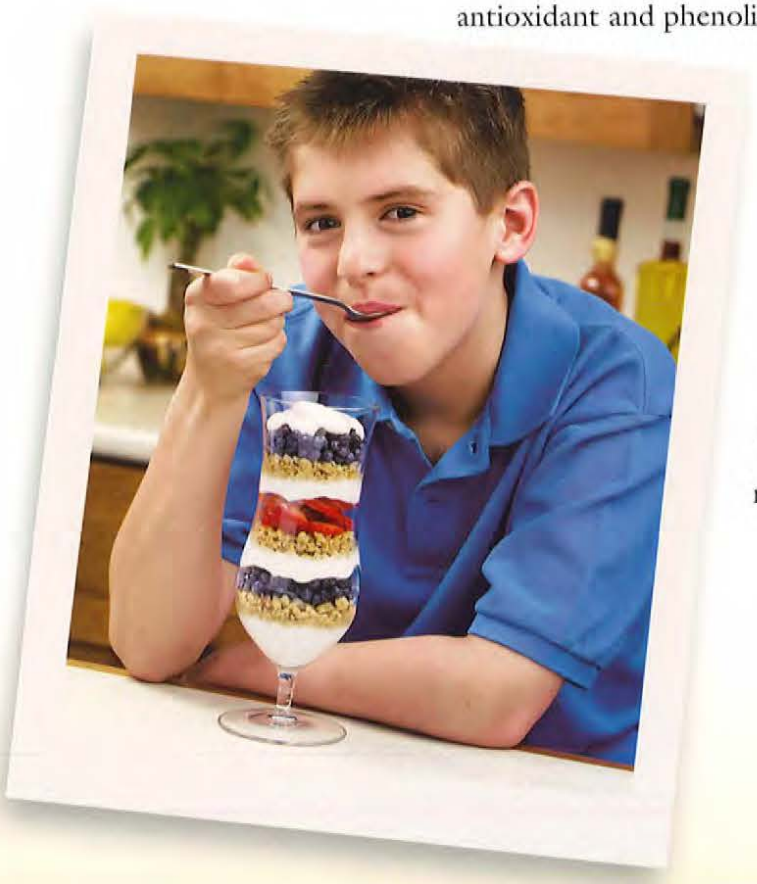
NOT JUST BLUEBERRIES.



THE WILD ADVANTAGE

All blueberries are not alike!

For food product designers, Wild Blueberries from Maine and Canada offer many advantages over their cultivated cousins. Smaller and more compact, with a more intense flavor, they freeze extraordinarily well and perform beautifully in a wide range of applications. Wild Blueberries also have more total antioxidant capacity than cultivated blueberries, and generally more beneficial antioxidant and phenolic compounds — making them a winning choice for your blueberry products.



EXTRAORDINARY TASTE

A unique mixture of sweet and tangy Wild Blueberry varieties produces a delicious burst of flavor that you just can't duplicate with other berry ingredients. This means your Wild Blueberry products will have a remarkable, memorable taste your customers will love.

Wild BLUEBERRIES.™

SPECIAL SIZE

Naturally smaller and more compact, Wild Blueberries deliver more berries per pound — up to three times more berries than cultivated, highbush blueberries. Your products will show more of the juicy blueberries consumers are looking for, with more Wild Blueberry taste in every bite.

SUPERIOR PERFORMANCE

Wild Blueberries add flavor while maintaining their taste, texture, shape and color throughout a variety of manufacturing processes. In fact, individually quick frozen (IQF) Wild Blueberries maintain their quality for up to two years and can be used frozen in food preparation for easy handling. Available year-round in a variety of forms and sizes, Wild Blueberries always perform beautifully.

MARKETABLE *Mystique*

By nature, Wild Blueberries have a "wild mystique" all their own. One of only three berries native to North America, they have an appealing "wild imagery" that powerfully distinguishes Wild Blueberry products from all others. Add to that their status as health heroes and you have a proven way to bring added value and excitement to your product line.

CHOOSE THE HEAL

MANUFACTURERS

With their reputation as a healthful ingredient spreading around the world, Wild Blueberries are turning up everywhere, in products of all kinds. From cereals and muffin mixes to jams and jellies, from teas and juices to yogurt, smoothies and ice cream, Wild Blueberry is an ingredient that adds taste, color and extra-healthy appeal.

BAKERIES

Wild Blueberries have an intense flavor and juicy texture that bakers prefer. And, because they're smaller and more compact, they hold their shape, color and flavor, while keeping baked products moist. As a result, muffins, pies, cakes and bagels have more of the look and taste your customers love — with the antioxidant goodness they're looking for.

THY *Ingredient.*

FOODSERVICE

Chefs know the value of a distinctive, premium ingredient like Wild Blueberries. Whether it's creating excitement with signature dishes or developing menu items with healthier, good-for-you properties, foodservice professionals appreciate the versatility, the colors and flavors, the ease of handling — the irresistibly healthy aura — that Wild Blueberries bring to the table.

NUTRACEUTICALS AND FUNCTIONAL FOODS

In Japan and Europe, interest in Wild Blueberries as a functional food has been strong for more than a decade — and Americans are catching on fast. Whether it's improving eyesight, defending against heart disease, cancer and Alzheimer's disease or maintaining urinary tract health, Wild Blueberries have what it takes in today's fast-growing functional food marketplace.

RETAIL FROZEN FRUIT

Within the fast-growing frozen-fruit segment of the retail marketplace, Frozen Wild Blueberries are superstars. As demand for Wild Blueberries has soared, more and more major food shopping outlets are stocking premium Frozen Wild Blueberries in convenient consumer packages year-round. The FDA has concluded that frozen fruits and vegetables are just as healthy as fresh and may even retain their nutritional value longer — which is good news for consumers who want the Power of Blue™ every day.

THE *Breakfast* BERRIES™

Your customers can get a healthy start every morning with easy and delicious Frozen Wild Blueberries. Just a half-cup of Wild Blueberries on cereal or blended into a smoothie delivers a daily fruit serving that's packed with antioxidants. Frozen Wild Blueberries are versatile, convenient and intensely flavorful — no wonder they're *The Breakfast Berries.*™

WILD BLUEBERRY *Forms.*

FORM	TRADE PACK	CONSUMER PACK	AVAILABILITY
INDIVIDUALLY QUICK FROZEN (IQF)	●	●	YEAR-ROUND
DRIED/DEHYDRATED/ SUGAR-INFUSED	●	●	YEAR-ROUND
CANNED	●	●	YEAR-ROUND
GLASS JARS		●	YEAR-ROUND
CONCENTRATE	●		YEAR-ROUND
PURÉE	●		YEAR-ROUND
POWDER	●		YEAR-ROUND
EXTRACT	●	●	YEAR-ROUND
FRESH	●	●	AUGUST TO SEPTEMBER
FROZEN FRESH	●	●	YEAR-ROUND

WILD BLUEBERRY FORMS

Highly versatile Wild Blueberries are the answer to today's most challenging product development needs. Available year-round, the berries can be purchased in a wide variety of forms, in sizes convenient to both the trade and consumers. Wild Blueberries perform beautifully, maintaining their taste, texture, shape and color throughout the manufacturing process.

NEW FORMS TO MEET YOUR NEEDS

Today, Wild Blueberries are available in virtually any format you need — with new, innovative forms emerging as part of the industry's ongoing R&D effort. Our product developers are continually striving to address new product development challenges and improve the performance of existing ingredient forms.

INGREDIENT BRANDING WITH *Wild* BLUEBERRIES.

It pays to tell your customers you're using delicious, antioxidant-rich Wild Blueberries by putting the words "Wild Blueberry" into your product name and by putting the Wild Blueberry certification mark on your package.

To learn how you can license the certification mark, contact the Wild Blueberry Association of North America at WILDBLUEBERRIES@GWI.NET or on the Web at WWW.WILDBLUEBERRIES.COM. We'll help you with your ingredient branding opportunities and add value to your products with Wild Blueberries, the ingredient that says "healthy."

WILD BLUEBERRIES®
Nature's Great Taste

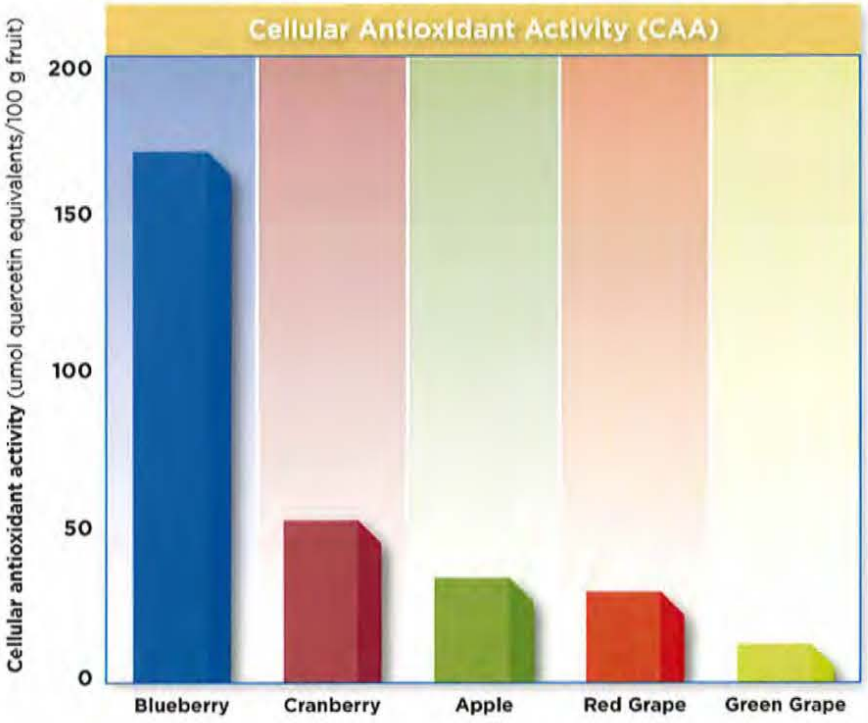
WILD BLUEBERRIES®

Nature's Great Taste

WWW.WILDBLUEBERRIES.COM

Wild Blueberries

New Antioxidant Research Confirms Wild Blueberry's Status as Top Berry!



Wild Blueberries #1 in Cellular Antioxidant Activity (CAA) Assay

Antioxidants are associated with many health benefits, from fighting cancer and heart disease to protecting against Alzheimer's and other effects of aging. And once again, studies confirm that the #1 antioxidant fruit is Wild Blueberry. Using the cellular antioxidant activity (CAA) assay, a new antioxidant research tool, Cornell University scientist Rui Hai Liu, Ph.D. compared antioxidant activity at the cellular level and found that Wild Blueberries outperformed cranberries, apples and both red and green grapes. This advanced CAA measure provides scientists with valuable insight into how antioxidant compounds potentially react in the body.

Journal of Agricultural and Food Chemistry, 2007; 55 (22), 8896-8907

More Reasons to Choose Nature's Antioxidant SuperFruit™

#1 in Total Antioxidant Capacity. USDA studies show that Wild Blueberries have the highest antioxidant capacity per serving, compared with more than 20 other fruits. Using the Oxygen Radical Absorbance Capacity (ORAC) testing procedure, researcher Ronald Prior, Ph.D., found that a serving of Wild Blueberries had more total antioxidant capacity (TAC) than a serving of cranberries, strawberries, plums, raspberries and even cultivated blueberries.

Journal of Agricultural and Food Chemistry, 2004, 52: 4026-4037

Fighting Oxidative Stress. Recently, Dr. Prior concluded that eating Wild Blueberries and other antioxidant-rich foods at every meal helps prevent oxidative stress. This study advances antioxidant research by moving beyond the measurement of antioxidants in foods to actual examination of the performance of specific fruits against oxidative stress in the body. Oxidative stress is linked to chronic diseases and aging.

Journal of the American College of Nutrition, 2007 Vol. 26, No. 2, 170-181

Wild Blueberries® Nature's Great Taste

www.wildblueberries.com

WILD BLUEBERRIES

Nature's ANTIOXIDANT SUPERFRUIT™

HEALTH RESEARCH OVERVIEW

Potent antioxidants are highly concentrated in the deep-blue pigments of Wild Blueberries. Scientists around the world are studying the ways in which this Antioxidant SuperFruit may help combat disease and promote healthy aging. Ongoing studies are focused on:

TOTAL ANTIOXIDANT CAPACITY

According to USDA studies, Wild Blueberries have the highest antioxidant capacity per serving, compared with more than 20 other fruits. Using the Oxygen Radical Absorbance Capacity (ORAC) testing procedure, researcher Ronald Prior, Ph.D., found that a one-cup serving of Wild Blueberries had more total antioxidant capacity (TAC) than a serving of cranberries, strawberries, plums, raspberries and even cultivated blueberries.

Journal of Agricultural and Food Chemistry, 2004, 52: 4026-4037

CELLULAR ANTIOXIDANT ACTIVITY

Wild Blueberries also outperformed selected fruits in an advanced procedure known as the cellular antioxidant activity (CAA) assay, an innovative means of measuring antioxidant activity inside cells. A Cornell University research team led by Dr. Rui Hai Liu conducted the study.

Journal of Agricultural and Food Chemistry, 2007; 55 (22), 8896-8907

HEALTHY-AGING

James Joseph, Ph.D., and his team at the USDA Human Nutrition Research Center on Aging in Boston report that a diet of blueberries may improve motor skills and reverse the short-term memory loss that comes with aging and age-related diseases such as Alzheimer's. USDA animal trials showed improved navigational skills after a two-month diet of blueberry extract. Although other fruits and vegetables were studied, only blueberries were effective in improving motor skills.

Nutritional Neuroscience, 6:153-162, 2003; Journal of Neuroscience, September 15, 1999, 19(18); 8114-8121

ANTI-INFLAMMATORY BENEFITS

More recently, Dr. Joseph has been studying the anti-inflammatory potential of the polyphenols in blueberries, since chronic inflammation at the cellular level is at the heart of many degenerative age-related diseases. When rats with neuronal lesions were fed a blueberry-supplemented diet, not only did they perform better in cognitive tests, the concentration of several substances in the brain that can trigger an inflammatory response was significantly reduced. The polyphenols in blueberries appear to inhibit the production of these inflammatory mediators.

Nutritional Neuroscience, 2008, (In Press)

Cancer Prevention

Studies conducted by Mary Ann Lila, Ph.D., Department of Natural Resources and Environmental Sciences, University of Illinois, Urbana-Champaign, indicate that compounds in Wild Blueberries may be effective inhibitors of both the initiation and promotion stages of cancer.

Journal of Agricultural and Food Chemistry, 52:6442, 2004; Journal of Food Science, Vol. 65, No. 2, 2000

Urinary Tract Health

At the Rutgers University Blueberry Cranberry Research Center, Amy Howell, Ph.D., showed that blueberries, like cranberries, contain compounds that prevent the bacteria responsible for urinary tract infections from attaching to the bladder wall.

Journal of Agricultural and Food Chemistry, 52:6442, 2004; New England Journal of Medicine, Volume 339, Number 15. 1998

Protection Against Stroke

Animal trials conducted by Marva Sweeney-Nixon, Ph.D., and her team at the University of Prince Edward Island, Canada, indicate that consumption of Wild Blueberries confers protection to the brain against damage from ischemic stroke.

Nutritional Neuroscience, 2002 Dec.; 5(6): 427-31

Heart Health

New research shows that blueberries may support cardiovascular health. A research team at Agriculture and Agri-Food Canada led by Wilhelmina Kalt, Ph.D., found that blueberry supplementation reduced plasma cholesterol levels. Additional research by Dorothy Klimis-Zacas, Ph.D., and her team at the University of Maine, Orono, concludes that a diet of Wild Blueberries may reduce risk from cardiovascular disease (CVD). Animal studies suggest that Wild Blueberries have the potential to decrease the vulnerability of heart blood vessels to oxidative stress and inflammation in animal models.

British Journal of Nutrition, 2007, Dec.; 1-9; Journal of Nutritional Biochemistry, 2006 Feb; 17(2): 109-16

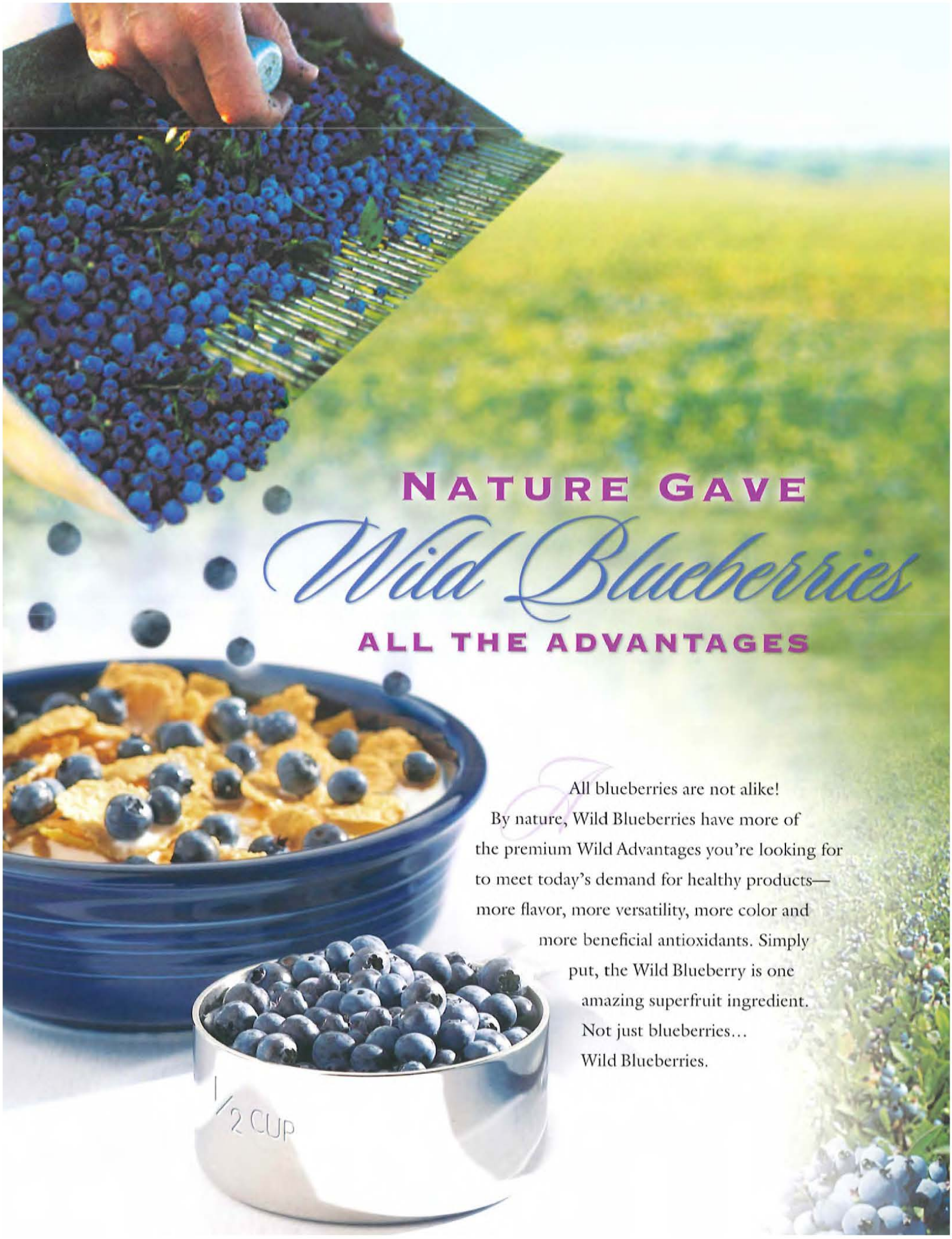
Fighting Oxidative Stress

USDA scientists recently concluded that eating Wild Blueberries and other antioxidant-rich foods at every meal helps prevent oxidative stress. This study moves beyond the measurement of antioxidants in foods to actual examination of the performance of specific fruits against oxidative stress in the body. Oxidative stress is linked to chronic diseases and aging.

Journal of the American College of Nutrition, 2007 Vol. 26, No. 2, 170-181

Wild Blueberry Association of North America
e-mail: wildblueberries@gwi.net
wildblueberries.com

One *Amazing* Superfruit Ingredient

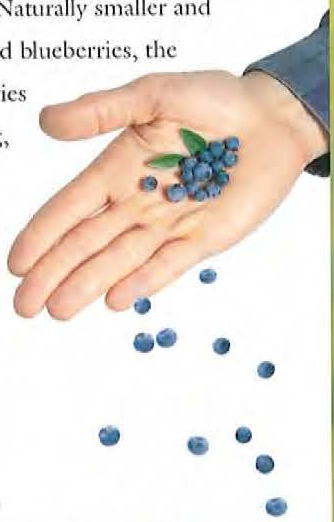

NATURE GAVE
Wild Blueberries
ALL THE ADVANTAGES
All blueberries are not alike!
By nature, Wild Blueberries have more of the premium Wild Advantages you're looking for to meet today's demand for healthy products—more flavor, more versatility, more color and more beneficial antioxidants. Simply put, the Wild Blueberry is one amazing superfruit ingredient.
Not just blueberries...
Wild Blueberries.
1/2 CUP

THE *Wild* ADVANTAGES

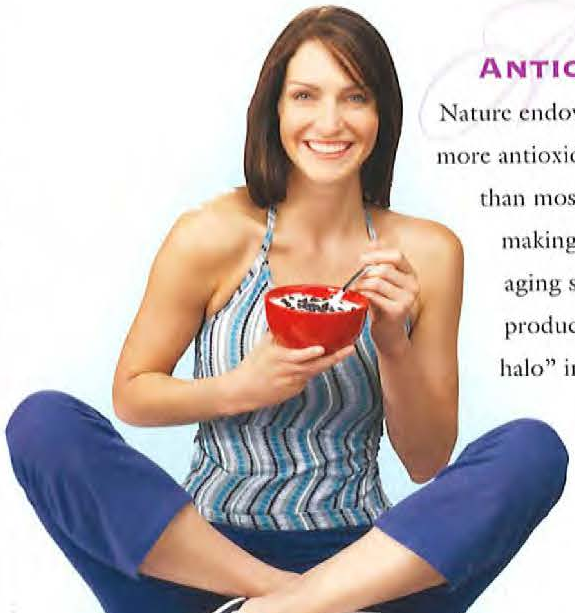
WILD MYSTIQUE

Only in the fields and barrens of Downeast Maine and Canada does Nature produce a blueberry so unique, it has a marketable "Wild" Mystique all its own.

SPECIAL SIZE Naturally smaller and more compact than cultivated blueberries, the Wild Ones deliver more berries per pound for better looking, better tasting products.



EXTRAORDINARY TASTE Wild Blueberries deliver a delicious burst of sweet and tangy flavor, a naturally intense blueberry taste that's hard to match.



ANTIOXIDANT POWER

Nature endowed Wild Blueberries with more antioxidant capacity per serving than most other fruit ingredients, making them a powerful anti-aging superfruit. This gives your products a distinctive "health halo" in today's marketplace.

SUPERIOR PERFORMANCE

Versatile Wild Blueberries add flavor and health functionality while maintaining their taste, texture, shape and deep blue color. And they freeze perfectly with quality and nutritional value intact.

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE

Learn more about the premium advantages of Wild Blueberries at
WILDBLUEBERRIES.COM

THE MARK of a Premium BERRY

Antioxidant Power

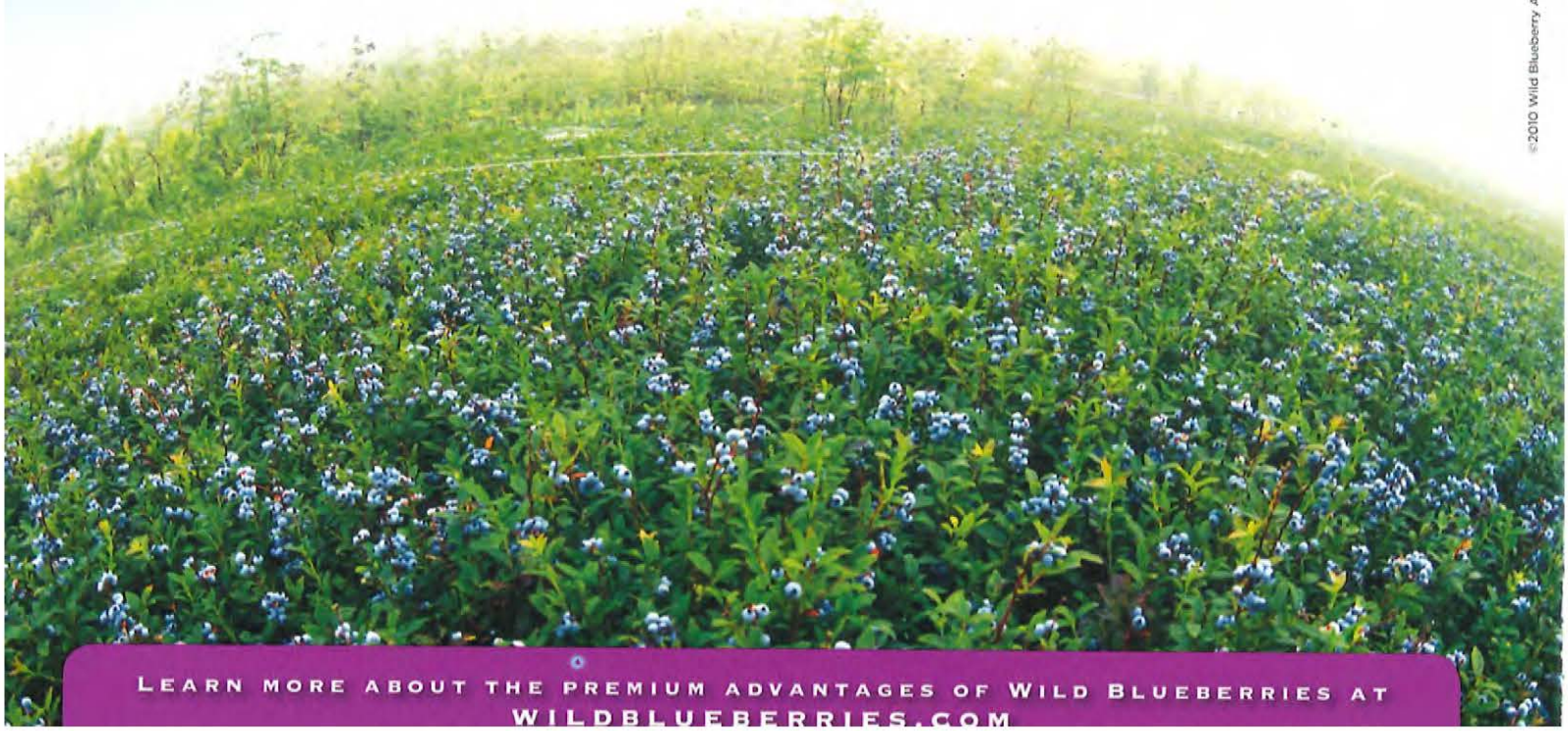
Wild Mystique

Extraordinary Taste

Superior Performance

Special Size

Nature gave Wild Blueberries all the premium advantages.
No wonder they're the world's #1 superfruit ingredient.



LEARN MORE ABOUT THE PREMIUM ADVANTAGES OF WILD BLUEBERRIES AT WILDBLUEBERRIES.COM

Wild Blueberries

Nature's Antioxidant SuperFruit™

Health Research Overview

Potent antioxidants such as anthocyanin are highly concentrated in the deep-blue pigments of Wild Blueberries. Scientists around the world are studying the ways in which this Antioxidant SuperFruit may help combat disease and promote healthy aging. Promising research focuses on:

- Antioxidant Capacity
- Healthy Aging
- Anti-inflammatory Benefits
- Cancer Prevention
- Urinary Tract Health
- Protection Against Stroke
- Heart Health
- Metabolic Syndrome
- Fighting Oxidative Stress
- Reducing Diabetes Risk

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE®

Total Antioxidant Capacity

According to USDA studies, Wild Blueberries have the highest antioxidant capacity per serving, compared with more than 20 other fruits. Using the Oxygen Radical Absorbance Capacity (ORAC) testing procedure, researcher Ronald Prior, Ph.D., found that a one-cup serving of Wild Blueberries had more total antioxidant capacity (TAC) than a serving of cranberries, strawberries, plums, raspberries and even cultivated blueberries.

Journal of Agricultural and Food Chemistry. 2004; 52: 4026-4037

Cellular Antioxidant Activity

Wild Blueberries also outperformed selected fruits in an advanced procedure known as the cellular antioxidant activity (CAA) assay, an innovative means of measuring antioxidant activity inside cells. A Cornell University research team led by Dr. Rui Hai Liu conducted the study.

Journal of Agricultural and Food Chemistry. 2008; 56(18): 8418-8426;
Journal of Agricultural and Food Chemistry. 2007; 55(22): 8896-8907

Healthy Aging

For more than a decade, the body of research supporting the beneficial effects of Wild Blueberry consumption on aging has been growing. In 1999, James Joseph, Ph.D., and his team at the USDA Human Nutrition Research Center on Aging at Tufts University first reported that a diet of blueberries may improve motor skills and reverse short-term memory loss. Although Joseph and his team studied other fruits and vegetables, only blueberries were effective in improving motor skills. Scientists continue to focus on the potential of blueberries to help fight age-related diseases such as Alzheimer's. Recent studies include:

- **Anti-inflammatory Benefits**

  Dr. Joseph's team studied the anti-inflammatory potential of the polyphenols in blueberries, including the potent antioxidant anthocyanin. When rats with neuronal lesions were fed a blueberry-supplemented diet, not only did they perform better in cognitive tests, the concentration of several substances in the brain that can trigger an inflammatory response was significantly reduced. The polyphenols in blueberries appear to inhibit the production of these inflammatory mediators.

- **Improving Memory Function**

  In the first human study of its kind, released in early 2010, researchers demonstrated that anthocyanin-rich Wild Blueberries are highly beneficial in maintaining memory function. The study, conducted by a team led by Dr. Robert Krikorian, Associate Professor of Psychiatry & Behavioral Neuroscience, University of Cincinnati, confirmed that Wild Blueberry supplemented diets improved memory function and mood in older adults with early memory decline. The findings suggest that regular consumption of Wild Blueberries may slow the loss of cognitive function and decrease depression in the elderly.

- **Berry Extracts and Brain Aging**

  A team led by Shibu Poulose, Ph.D. at the USDA Human Nutrition Center on Aging studies the build-up of biochemical debris in the brain, which they believe contributes to the decline of mental functioning with age. His team found that extracts from blueberries and other deeply colored berries enable "housekeeper" cells in the brain to remove the toxic chemicals before they do damage.

Nutritional Neuroscience. 2003; 6:153-162;
Journal of Neuroscience. 1999; 19(18): 8114-8121
Nutritional Neuroscience. 2008; 11(4): 172-182
Journal of Agricultural and Food Chemistry. 2010; 58, 3996-4000
American Chemical Society Abstract. 2010

> *"Our preliminary memory findings are encouraging and suggest that supplementing one's diet with blueberries may help forestall cognitive aging."*
>
> **Robert Krikorian, Ph.D.,**
> Associate Professor of Psychiatry & Behavioral Neuroscience, University of Cincinnati

Fighting Oxidative Stress

USDA scientists concluded that eating Wild Blueberries and other antioxidant-rich foods at every meal helps prevent oxidative stress. This study moves beyond the measurement of antioxidants in foods to actual examination of the performance of specific fruits against oxidative stress in the body. Oxidative stress is linked to chronic diseases and aging.

Journal of the American College of Nutrition. 2007; 26(2): 170-181

Cancer Prevention

Studies conducted by Mary Ann Lila, Ph.D., North Carolina State University, Plants for Human Health Institute, indicate that compounds in Wild Blueberries may be effective inhibitors of both the initiation and promotion stages of cancer.

Journal of Agricultural and Food Chemistry. 2004; 52(21): 6433-6442; Journal of Food Science. 2000; 65(2)

Urinary Tract Health

At the Rutgers University Blueberry Cranberry Research Center, Amy Howell, Ph.D., showed that blueberries, like cranberries, contain compounds that prevent the bacteria responsible for urinary tract infections from attaching to the bladder wall.

Journal of Agricultural and Food Chemistry. 52(21): 6433-6442; New England Journal of Medicine. 1998; 339(15)

Protection Against Stroke

Animal trials conducted by Marva Sweeney-Nixon, Ph.D., and her team at the University of Prince Edward Island, Canada, indicate that consumption of Wild Blueberries confers protection to the brain against damage from ischemic stroke.

Nutritional Neuroscience. 2002; 5(6): 427-431

Heart Health

New research shows that blueberries may support cardiovascular health. A research team at Agriculture and Agri-Food Canada led by Wilhelmina Kalt, Ph.D., found that blueberry supplementation reduced plasma cholesterol levels. Additional research by Dorothy Klimis-Zacas, Ph.D., and her team at the University of Maine, Orono, concludes that a diet of Wild Blueberries may reduce risk from cardiovascular disease (CVD). Animal studies suggest that Wild Blueberries have the potential to decrease the vulnerability of heart blood vessels to oxidative stress and inflammation in animal models.
In addition, a team led by Dr. Joseph and his USDA colleague Dr. Barbara Shukitt-Hale, collaborated with Dr. Don Ingram from Louisiana State University's Pennington Biomedical Research Center on a study in the area of cardiovascular health demonstrating that a blueberry-enriched diet protects the heart muscle from damage in animal models.

Mutation Research/Genetic Toxicology and Environmental Mutagenesis, 2010; In Press Journal of Medicinal Food. 2009 Feb; 12(1): 21-8 and Journal of Nutritional Biochemistry. 2009 Jan 19; British Journal of Nutrition. 2008; 100(1): 70-78; Journal of Nutritional Biochemistry. 2006; 17(2): 109-116
PLoS One 2009 June 18; 4(6): e5954

Metabolic Syndrome

A promising area of blueberry research is related to metabolic syndrome, a combination of medical disorders including high blood pressure, high cholesterol, abdominal obesity, and impaired glucose tolerance, responsible for increased risk for cardiovascular disease and diabetes. Working with Wild Blueberry anthocyanins, Mary Ann Lila, Ph.D., from North Carolina State University, Plants for Human Health Institute led a team of researchers who found that blueberry phytochemicals helped alleviate hyperglycemia in rodent models, a condition associated with metabolic syndrome.

Phytomedicine. 2009 May; 16(5): 406-15

Reducing Diabetes Risk

A study led by Dr. April Stull and Dr. William Cefalu of the Pennington Biomedical Research center at Louisiana State University found that daily consumption of whole blueberries helped people with a high risk for Type 2 diabetes reduce that risk. The bioactives in blueberries increased the participants' insulin sensitivity, a key factoring preventing Type 2 diabetes.

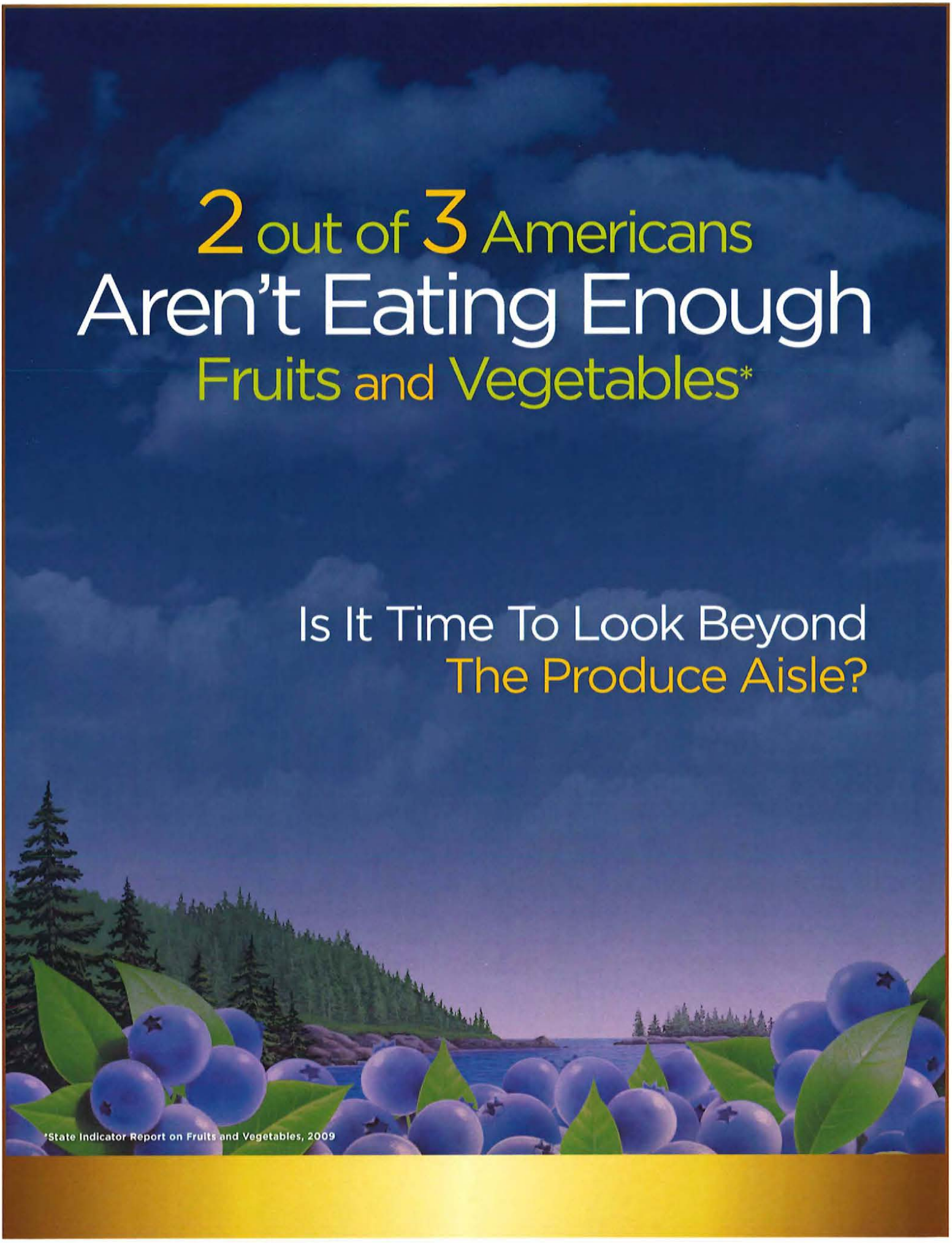
Journal of Nutrition. 2010 Oct; 140(10): 1764-8

"Dr. Cefalu's study breaks new ground in terms of how whole foods like blueberries may help prevent serious health conditions like Type 2 diabetes.."

Susan Davis, MS, RD, Nutrition Advisor to the Wild Blueberry Association of North America

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE

wildblueberries.com


2 out of 3 Americans
Aren't Eating Enough
Fruits and Vegetables*
Is It Time To Look Beyond
The Produce Aisle?
*State Indicator Report on Fruits and Vegetables, 2009

THE Case FOR Frozen Fruits and Veggies

Take A Closer Look At Frozen

Recent studies indicate that Americans of all ages are failing to get their daily recommended servings of fruits and veggies—despite the fact that a diet rich in fruits and vegetables can help maintain a healthy weight and reduce the risk of chronic diseases like diabetes, heart disease and some cancers. Part of the solution may be to *increase the availability of affordable fruits and veggies*—that's why it's time to take a closer look at frozen produce.

Colorful, Convenient & Nutritious

Frozen fruits and vegetables are convenient and available year-round. What's more, frozen makes it easy to get the colorful variety needed to ensure the widest range of vitamins, minerals and phytochemicals. Plus, the FDA has concluded that frozen produce is just as nutritious as fresh and may even retain its nutritional value longer—for all these reasons, frozen is an excellent value for consumers wanting to increase their intake while making the most of their food dollar.

fruits & veggies more matters®

Frozen Wild Blueberries THE Power OF Blue

In the spectrum of healthy fruits, Frozen Wild Blueberries stand out—for their delicious taste, small size and big health benefits. With more antioxidant capacity per serving than most other fruits, Frozen Wild Blueberries have more of what it takes to combat disease and promote healthy aging. Just a ½ cup satisfies

one fruit serving and is a good source of dietary fiber. Simply put, Frozen Wild Blueberries are the easy way to get the Power of Blue® every day!

THE MARK OF A Healthy Berry

More Antioxidant Power

Available Year-Round

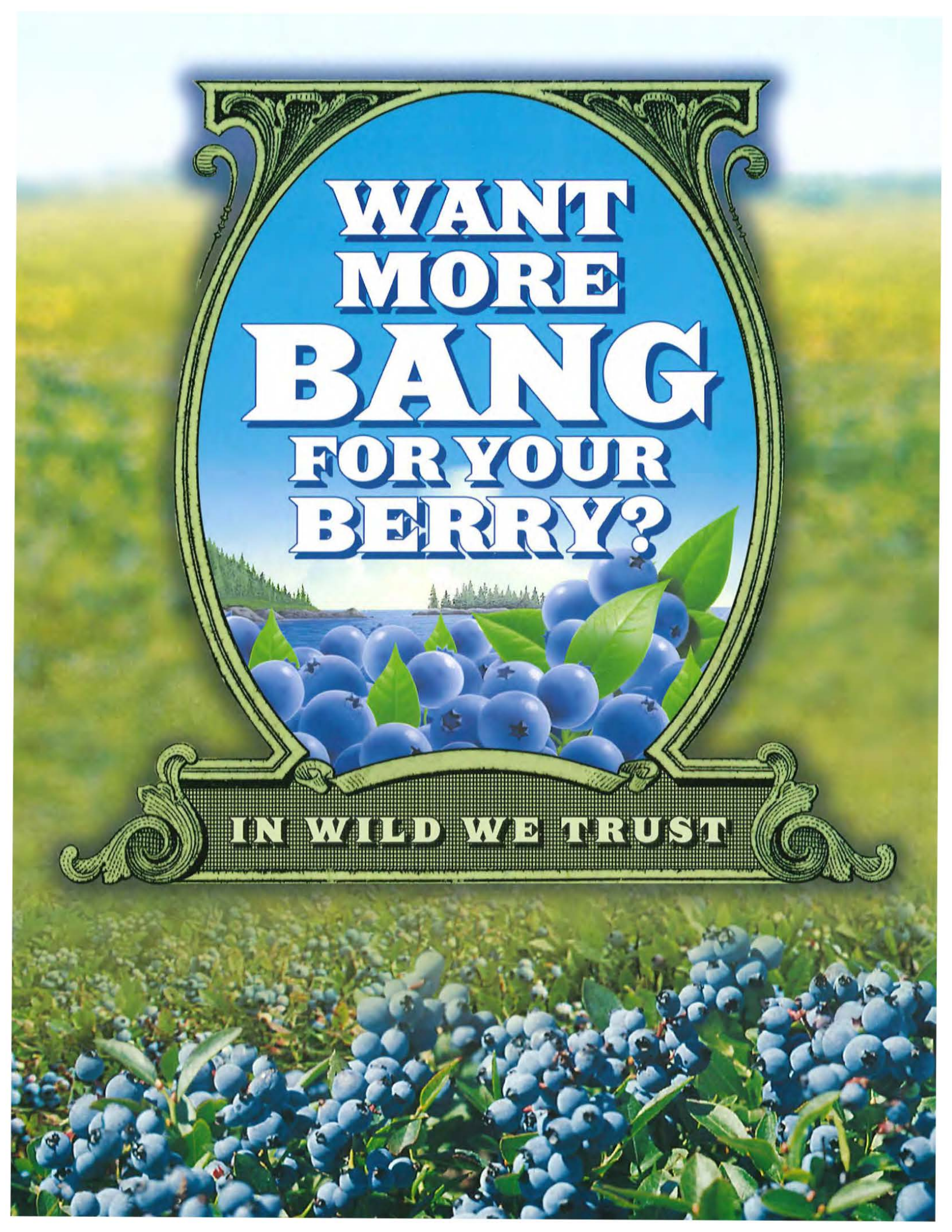
The Little Berries With Big Health Benefits

Just As Nutritious As Fresh

Not just Blueberries, Wild Blueberries

Frozen Wild Blueberries.
Nature's Antioxidant SuperFruit.™

LEARN MORE ABOUT THE HEALTH ADVANTAGES OF WILD BLUEBERRIES AT
wildblueberries.com


WANT
MORE
BANG
FOR YOUR
BERRY?
IN WILD WE TRUST

CHOOSE WILD BLUEBERRIES

NATURE'S PREMIUM SUPERFRUIT INGREDIENT

5 REASONS TO GO WILD

MORE BERRIES

Naturally smaller Wild Blueberries deliver more than twice the number of berries per pound than cultivated blueberries.

MORE PERFORMANCE

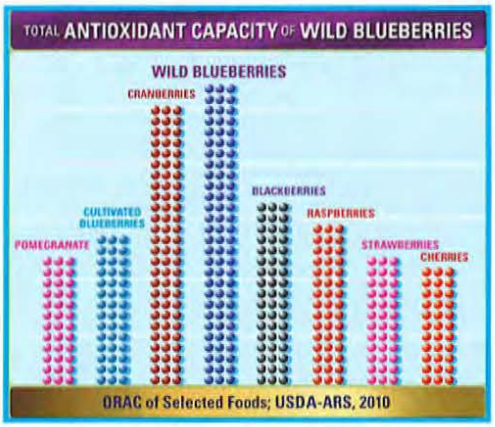
Wild Blueberries add flavor while better maintaining their shape, texture, color and outstanding nutritional value.

MORE FLAVOR

A variety of sweet and tangy flavors combine to create a more intense Wild Blueberry taste that cultivated blueberries simply can't match.

MORE ANTIOXIDANT POWER

Wild Blueberries have more total antioxidant capacity as measured by ORAC (Oxygen Radical Absorbance Capacity) than most other fruits—including cultivated blueberries!*



MORE NATURAL GOODNESS

From the fields and barrens of Downeast Maine and Canada comes a blueberry with more of Nature's wild advantages.

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE

www.wildblueberries.com

THE MARK of a Premium BERRY

Antioxidant Power

Natural Goodness

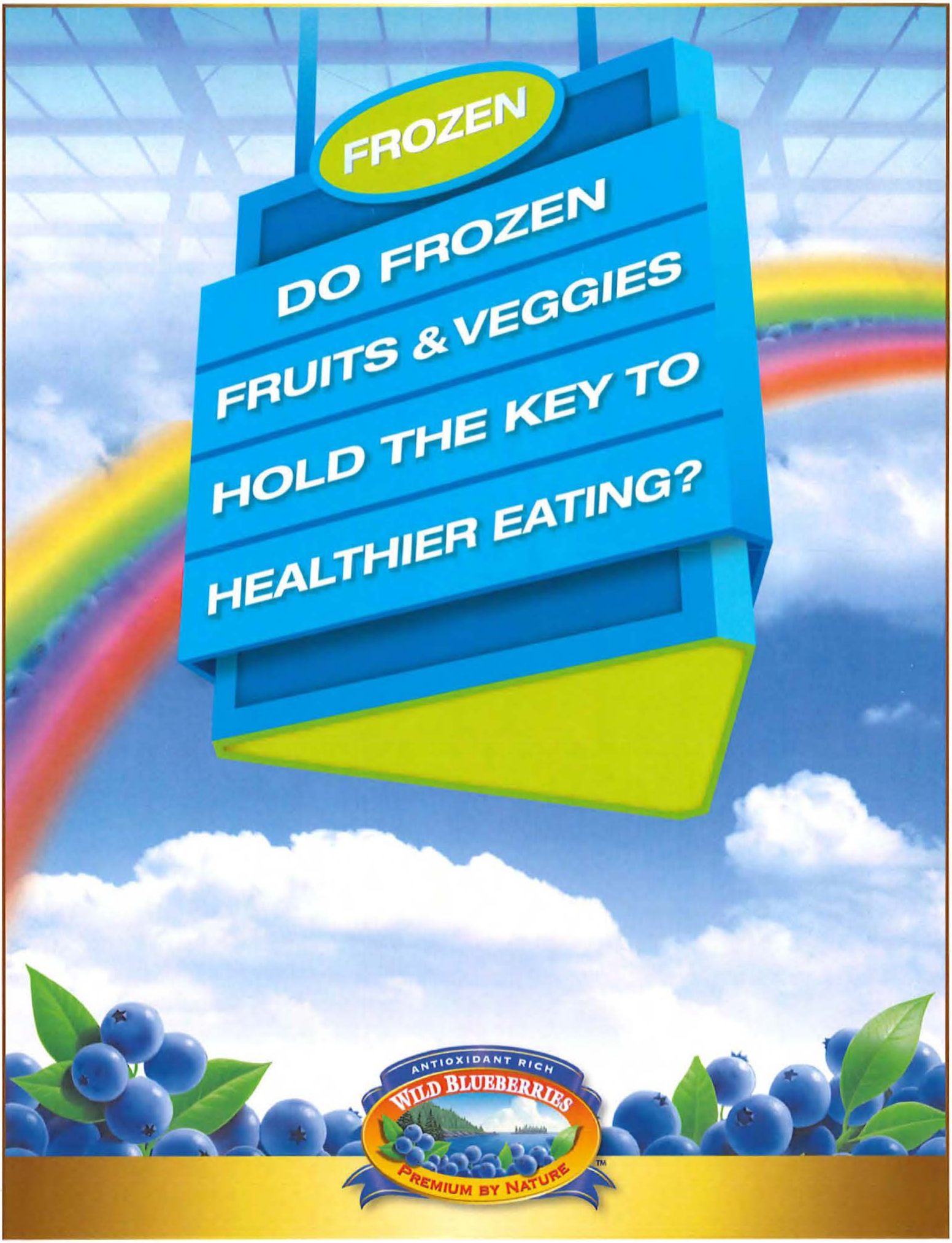
Extraordinary Flavor

Superior Performance

Special Size

Nature gave Wild Blueberries all the premium advantages.
No wonder they're nature's premium superfruit ingredient.

LEARN MORE ABOUT THE PREMIUM ADVANTAGES OF WILD BLUEBERRIES AT WWW.WILDBLUEBERRIES.COM


FROZEN
DO FROZEN FRUITS & VEGGIES HOLD THE KEY TO HEALTHIER EATING?
ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE

Breaking THE Frozen Barrier

Take A Closer Look At Frozen

Recent studies indicate that Americans of all ages are failing to get their daily recommended servings of fruits and veggies—despite the fact that a diet rich in fruits and vegetables can help maintain a healthy weight and reduce the risk of chronic diseases like diabetes, heart disease and some cancers. Part of the solution may be to *increase the availability of affordable fruits and veggies*—that's why it's time to take a closer look at frozen produce. *It's time to break the frozen barrier!*

Colorful, Convenient & Nutritious

Frozen fruits and vegetables are convenient and available year-round. What's more, frozen makes it easy to get the colorful variety needed to ensure the widest range of vitamins, minerals and phytochemicals. Plus, the FDA has concluded that frozen produce is just as nutritious as fresh and may even retain its nutritional value longer. For all these reasons, frozen is an excellent value for consumers wanting to increase their intake while making the most of their food dollar.

fruits & veggies more matters®

Frozen Wild Blueberries THE Power OF Blue

In the spectrum of healthy fruits, Frozen Wild Blueberries stand out—for their delicious taste, small size and big health benefits. With more antioxidant capacity per serving than most other fruits, Frozen Wild Blueberries have more of what it takes to combat disease and promote healthy aging. Just a half-cup satisfies

one fruit serving and is a good source of dietary fiber. Simply put, Frozen Wild Blueberries are the easy way to get the Power of Blue® every day!

THE MARK OF A Healthy Berry

More Antioxidant Power

Available Year-Round

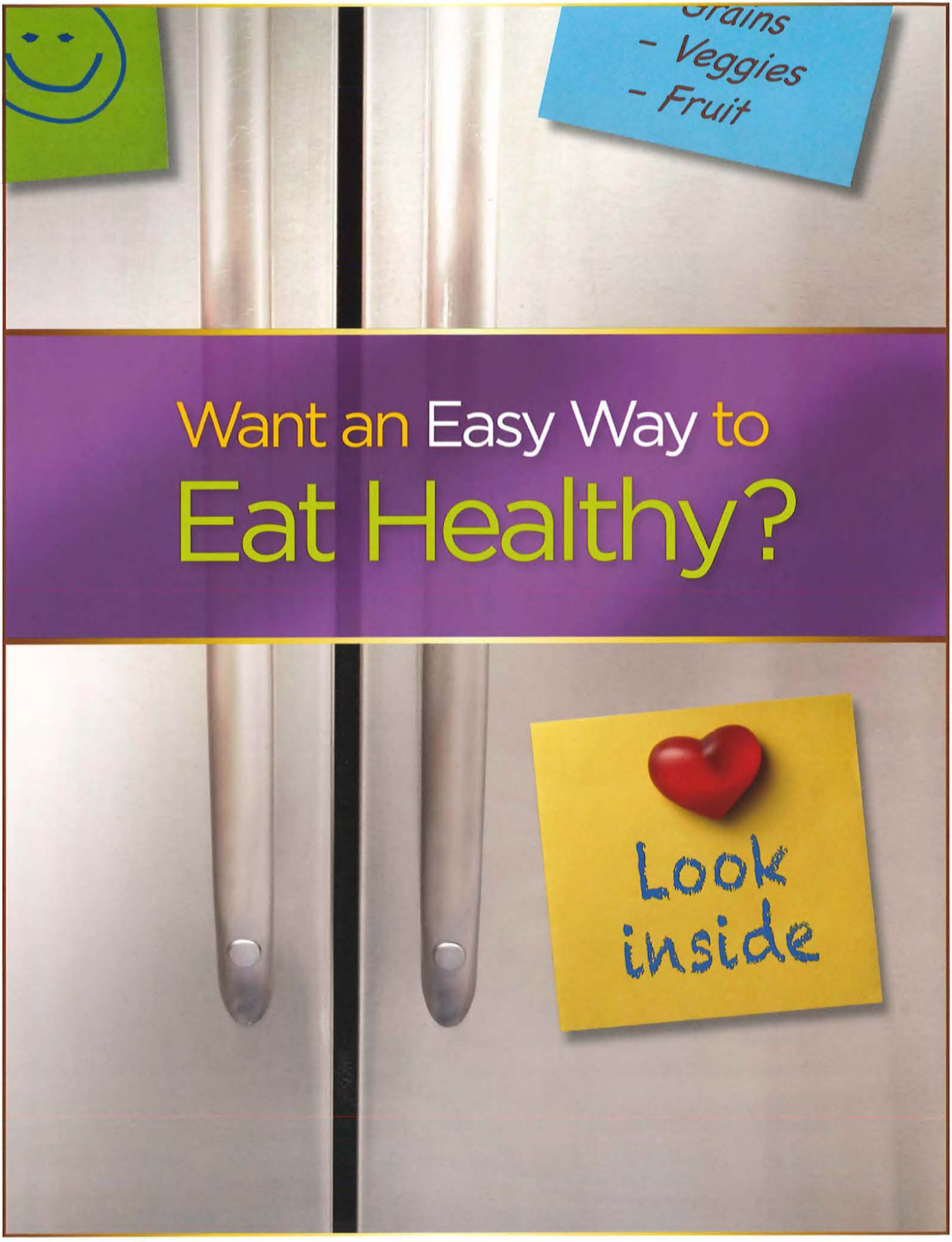
The Little Berries With Big Health Benefits

Just As Nutritious As Fresh

Not just Blueberries, Wild Blueberries

Frozen Wild Blueberries.
Nature's Antioxidant SuperFruit.™

LEARN MORE ABOUT THE HEALTH ADVANTAGES OF WILD BLUEBERRIES AT
wildblueberries.com



Want an Easy Way to Eat Healthy?

Think Frozen Fruits & Veggies!

No More Excuses

Most Americans know they should be getting more fruits and vegetables into their daily diets. Yet few of us actually meet our USDA recommendations. Researchers cite availability, affordability and convenience as reasons for our collective failure to eat more fresh produce. So maybe it's time to "think frozen."

Filling half your plate with fruits and veggies is easy and affordable with today's amazing variety of quality frozen produce.

Easy, Convenient, Affordable

Consider the many benefits of frozen fruits and veggies:

- Quick and easy preparation
- Nutritional value equal to fresh
- 4-season availability
- Appealing variety of taste and texture
- Dependable quality
- Affordability

In short, frozen produce offers an excellent value for consumers wishing to improve their diets while making the most of their food dollar.

The "healthy freezer" holds fruits, veggies and the potential for an easy and affordable solution to healthy eating.

Frozen Fresh Wild Blueberries. The Convenient Antioxidant Superfruit

All frozen fruits and veggies are good for you, but Frozen Fresh Wild Blueberries are health super stars! Small in size and big in flavor, Frozen Fresh Wild Blueberries have more antioxidant capacity per serving than most other fruits and vegetables*. In fact, they provide twice the antioxidant capacity of larger, cultivated blueberries, offering more of what it takes to combat disease and promote healthy aging.

For a better blueberry, go Wild!

More Antioxidant Power

Not just Blueberries, Wild Blueberries

Available Year-Round

The Little Berries With Big Health Benefits

Just As Nutritious As Fresh

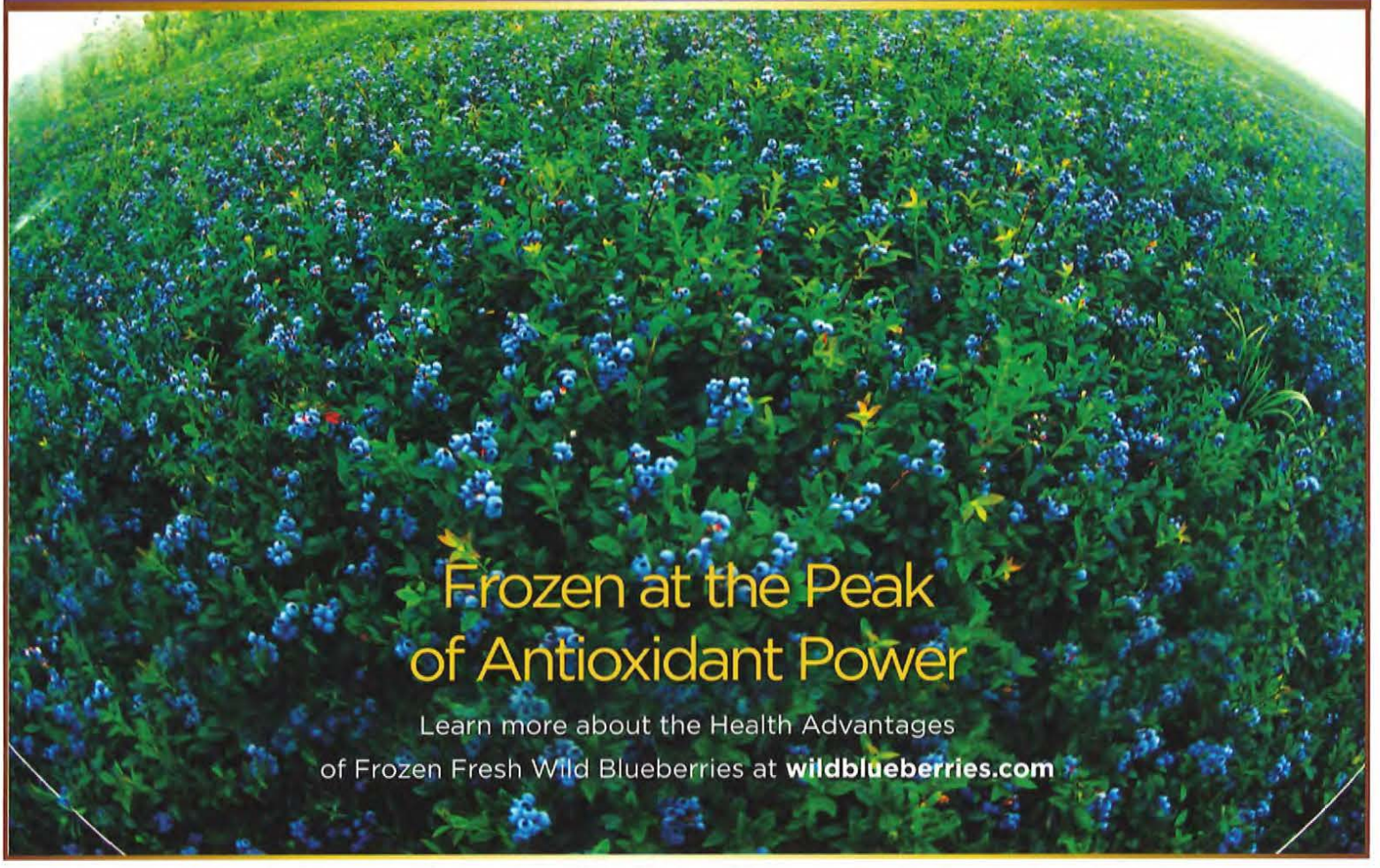
ANTIOXIDANT RICH

WILD BLUEBERRIES

PREMIUM BY NATURE®

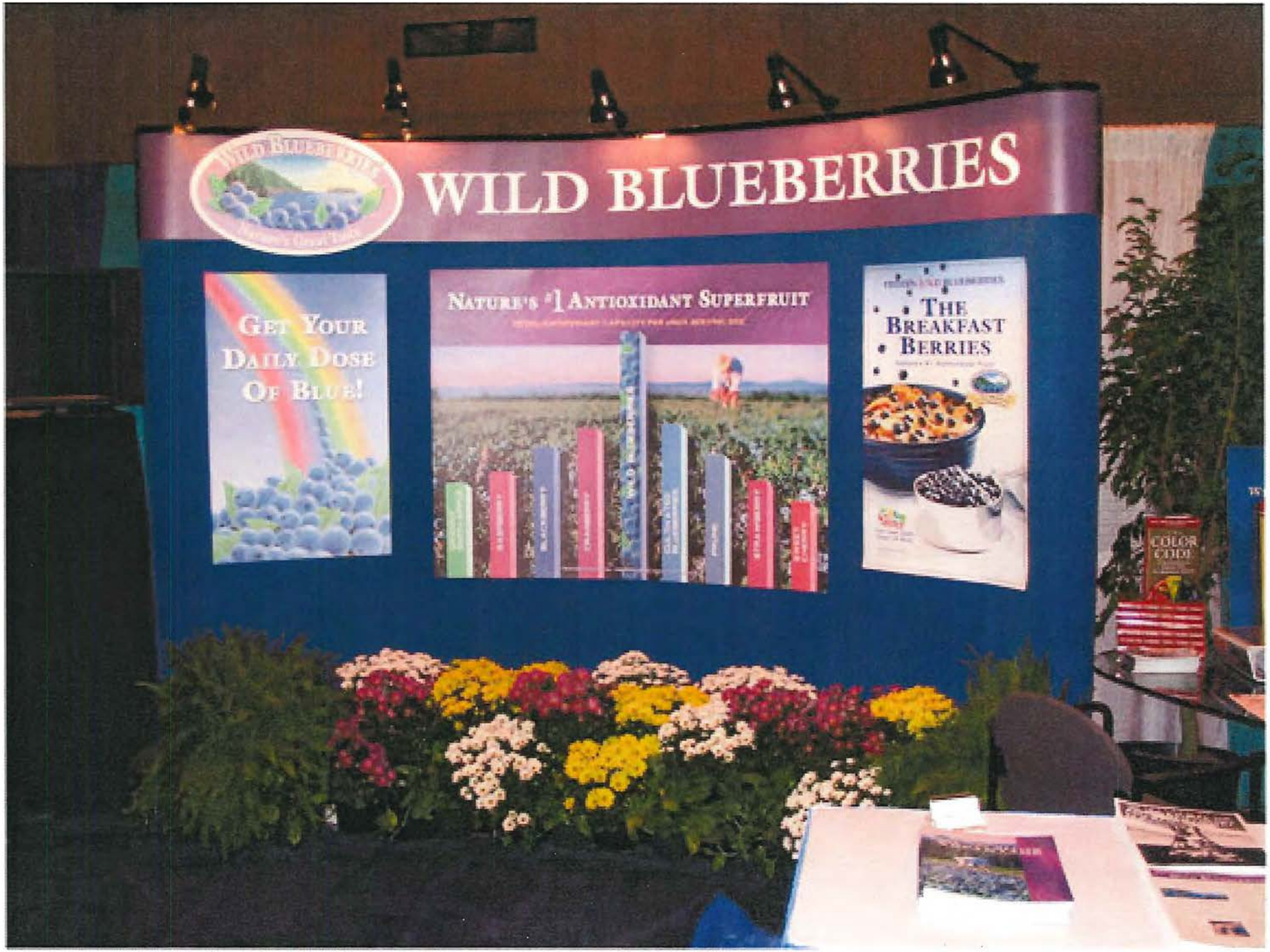
Frozen Fresh Wild Blueberries

The Convenient Antioxidant Superfruit



Frozen at the Peak of Antioxidant Power

Learn more about the Health Advantages of Frozen Fresh Wild Blueberries at **wildblueberries.com**

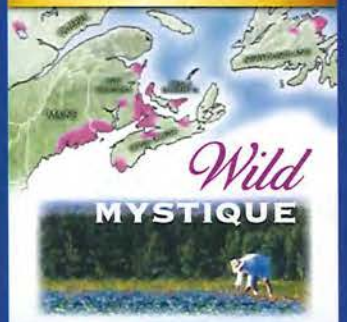

WILD BLUEBERRIES
GET YOUR DAILY DOSE OF BLUE!
NATURE'S #1 ANTIOXIDANT SUPERFRUIT
THE BREAKFAST BERRIES


WILD BLUEBERRIES
Nature's Great Taste
WILD BLUEBERRIES
The INGREDIENT THAT SAYS Healthy
NATURE'S ANTIOXIDANT SUPERFRUIT
TOTAL ANTIOXIDANT CAPACITY PER USDA SERVING SIZE
GRANNY SMITH APPLE
RASPBERRY
BLACKBERRY
CRANBERRY
WILD BLUEBERRIES
CULTIVATED BLUEBERRIES
PRUNE
STRAWBERRY
SWEET CHERRY
OXYGEN RADICAL ABSORBANCE CAPACITY (ORAC)

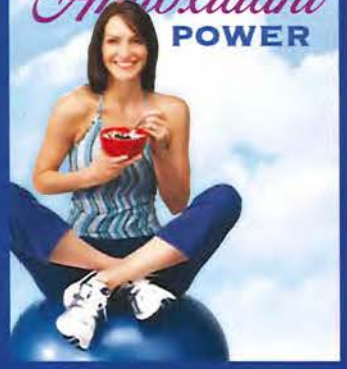

WILD BLUEBERRIES
GET YOUR DAILY DOSE OF BLUE
NATURE'S ANTIOXIDANT SUPERFRUIT
BE GOOD TO YOUR CELLS
WILD BLUEBERRIES
1500
1600

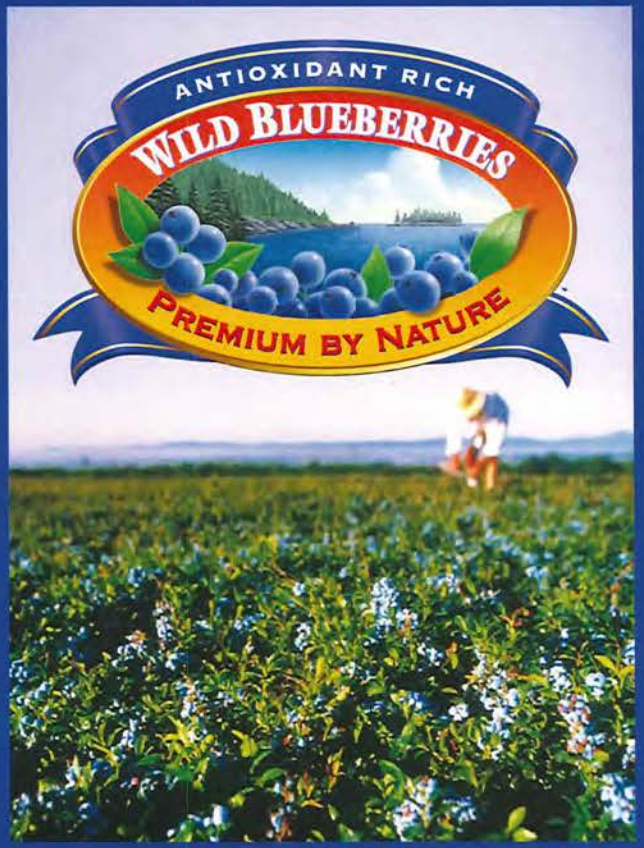
Wild Blueberries

Five Wild Advantages



Antioxidant POWER





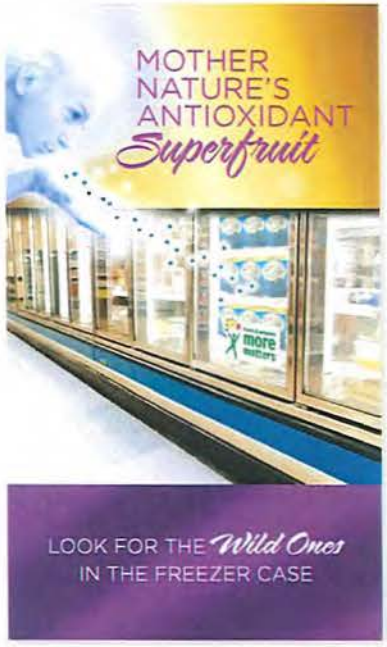
One Amazing Superfruit

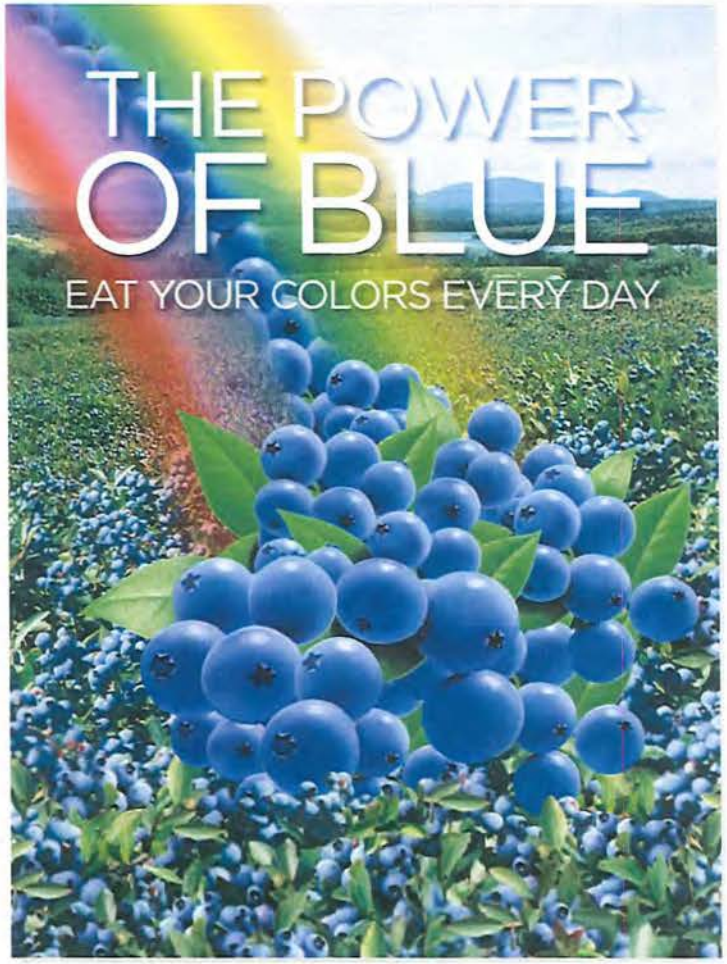
Superior PERFORMANCE

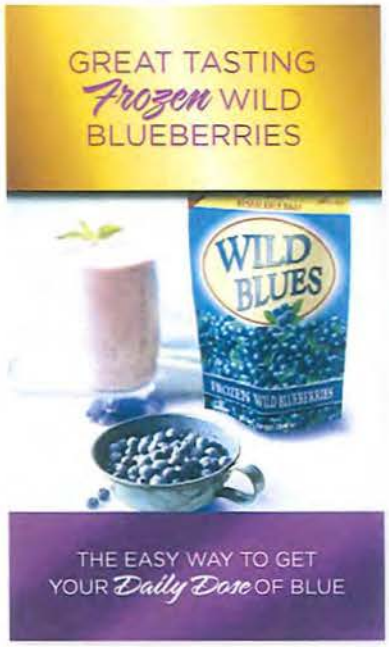
Extraordinary TASTE

Special SIZE

Wild Blueberries







Wild Blueberries

More ANTIOXIDANT POWER

More FLAVOR

More BERRIES

2X per pound

compared with cultivated blueberries.

MORE BANG FOR YOUR BERRY

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE

IN WILD WE TRUST

More PERFORMANCE

More NATURAL GOODNESS

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Think Frozen
The Easy Way to Eat Healthy

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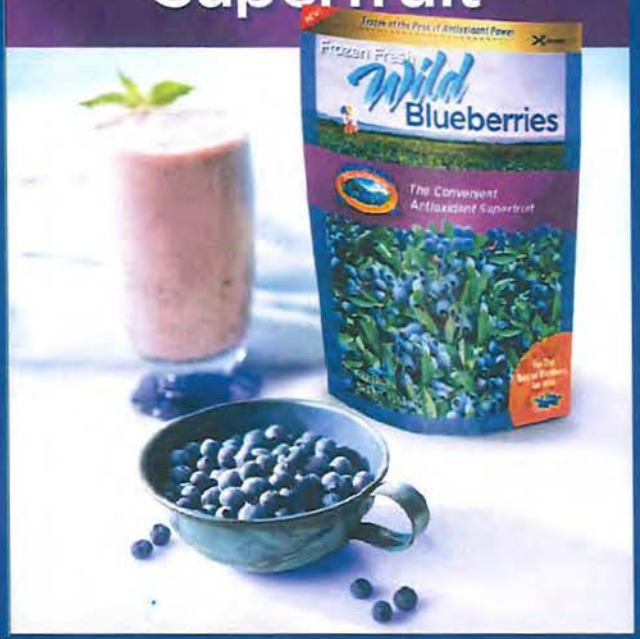
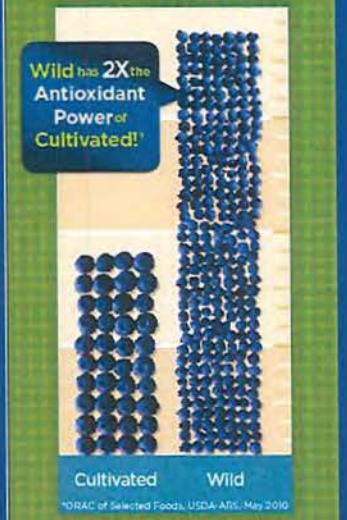


For a Better Blueberry, Go Wild!

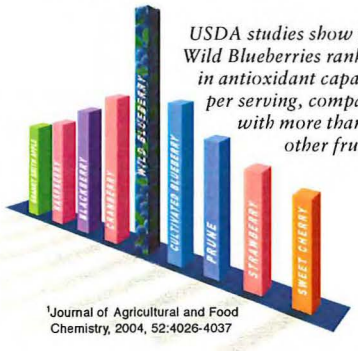


WILD BLUEBERRIES

BE GOOD TO YOUR CELLS.

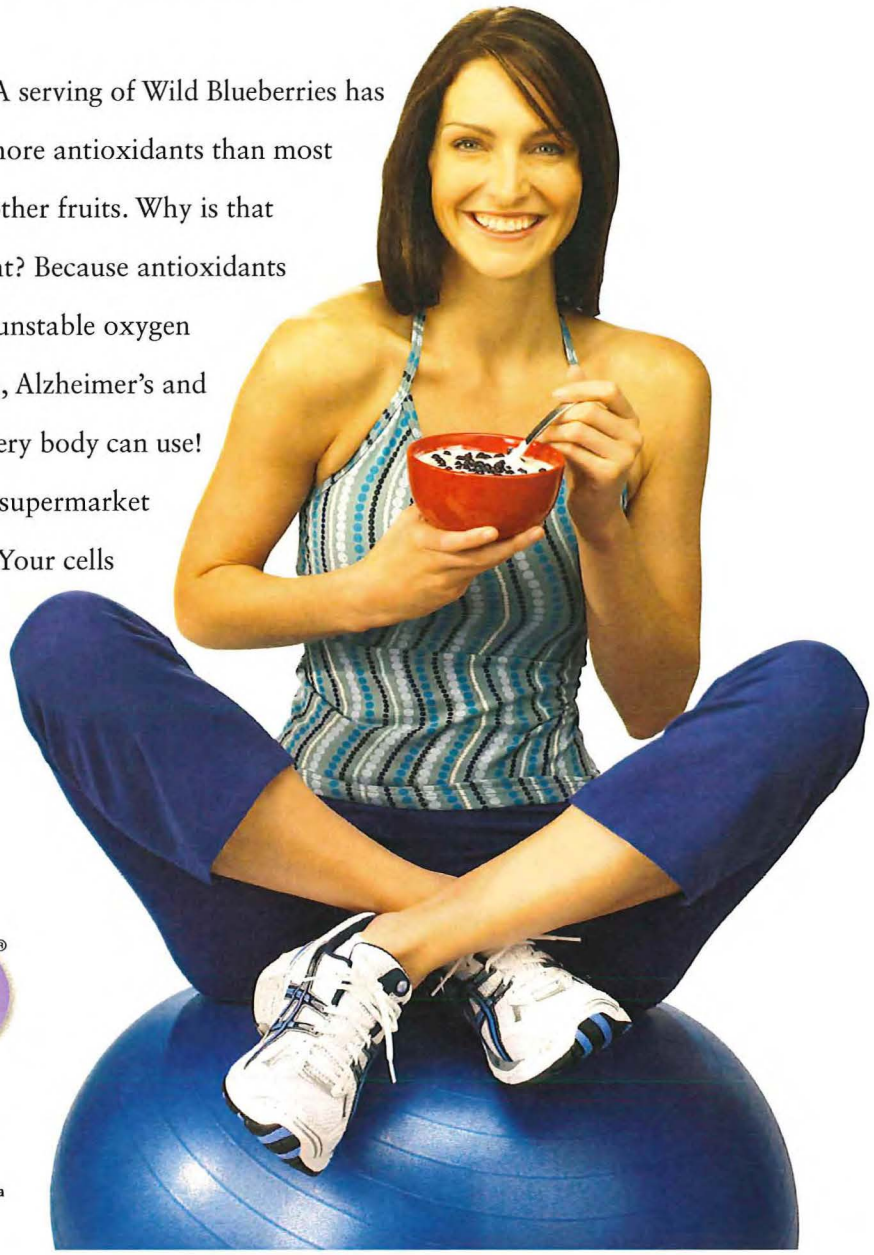
EAT WILD BLUEBERRIES: NATURE'S ANTIOXIDANT SUPERFRUIT™

A serving of Wild Blueberries has more antioxidants than most other fruits. Why is that important? Because antioxidants protect your cells against free radicals—those unstable oxygen molecules associated with cancer, heart disease, Alzheimer's and other effects of aging. Now that's protection every body can use! Look for Wild Blueberries year-round in your supermarket freezer section. Your cells will thank you.



USDA studies show that Wild Blueberries rank #1 in antioxidant capacity per serving, compared with more than 20 other fruits.[1]

[1]Journal of Agricultural and Food Chemistry, 2004, 52:4026-4037



WILD BLUEBERRIES®
Nature's Great Taste

WILDBLUEBERRIES.COM

One SuperFruit Ingredient.
Five Wild Advantages.

1. **Nature's Antioxidant SuperFruit**
   More antioxidant capacity per serving than most other fruit ingredients*
2. **Extraordinary Taste**
   Intense sweet and tangy flavor your customers will love
3. **Special Size**
   Smaller and more compact, delivering more berries per pound
4. **Superior Performance**
   Adding flavor while maintaining taste, texture, shape and color
5. **Marketable Wild Mystique.**
   An appealing "Wild" imagery all their own

LEARN MORE AT
WILDBLUEBERRIES.COM

* JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY, 2004, 52: 4026-4037

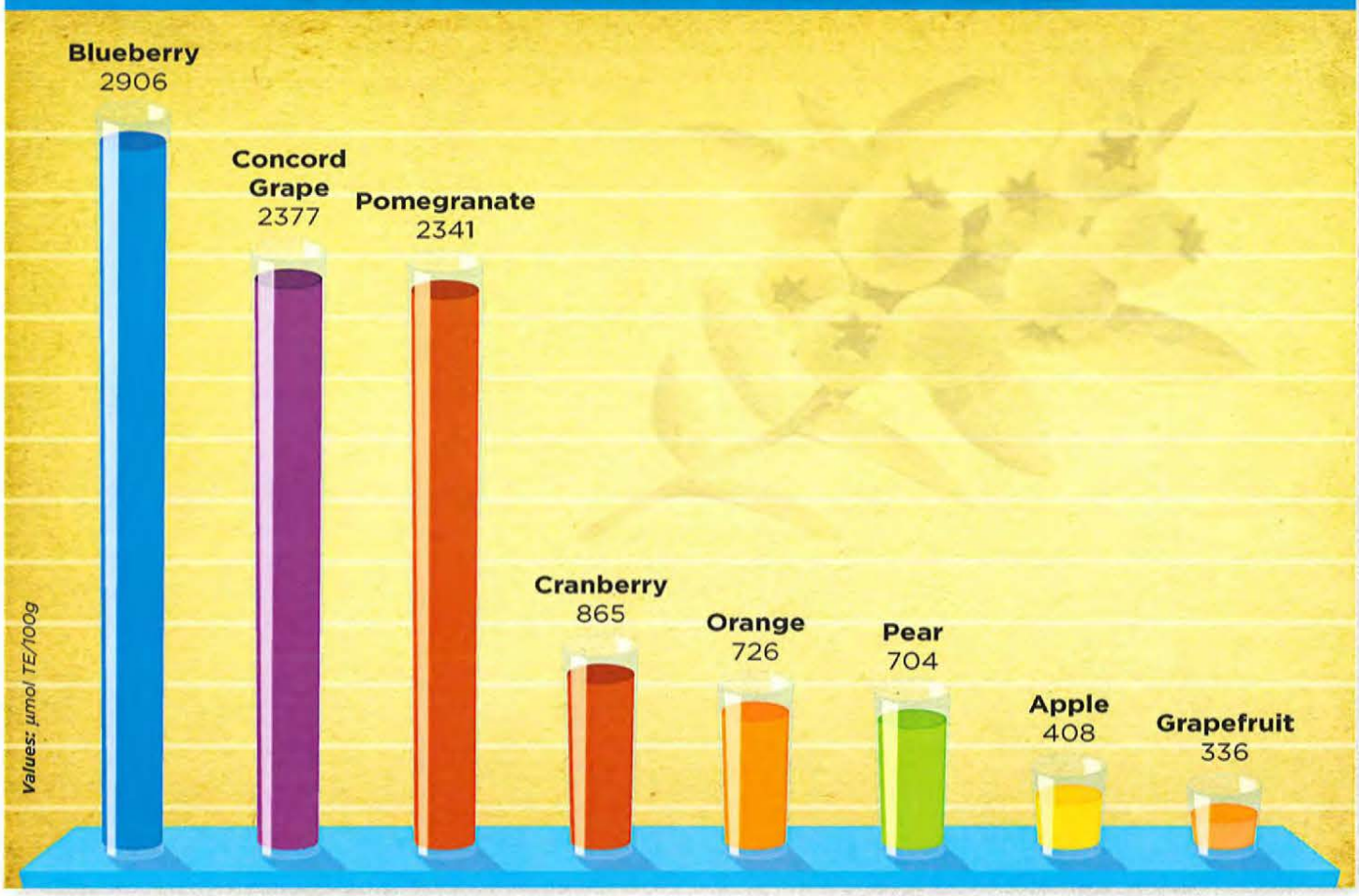
WILD BLUEBERRIES®
Nature's Great Taste




Wild Blueberries

Nature's ANTIOXIDANT SUPERFRUIT™

ORAC Antioxidant Values for Juices



* **Source:** USDA Agricultural Research Service, Oxygen Radical Absorbance Capacity (ORAC) of Selected Foods—2007.

IN RECENT USDA STUDIES, BLUEBERRY JUICE RANKED #1 IN ANTIOXIDANT CAPACITY PER 100g SERVING, USING THE OXYGEN RADICAL ABSORBANCE CAPACITY (ORAC) MEASURE*. BLUEBERRY JUICE TOPPED POMEGRANATE JUICE, CONCORD GRAPE JUICE, CRANBERRY JUICE AND FOUR OTHER FRUIT JUICES.

Wild Blueberries®
Nature's Great Taste

www.wildblueberries.com

ONE *Amazing* SUPERFRUIT INGREDIENT

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE™

THE *Wild* ADVANTAGE

Wild mystique. Special size. Extraordinary taste. Antioxidant power. Superior performance. Nature gave Wild Blueberries all the premium advantages.

SPECIAL SIZE Naturally smaller and more compact than cultivated blueberries, the Wild Ones deliver more berries per pound for better looking, better tasting products.

WILD MYSTIQUE

Only in the fields and barrens of Downeast Maine and Canada does Nature produce a blueberry so unique, it has a marketable "Wild" Mystique all its own.

EXTRAORDINARY TASTE Wild Blueberries deliver a delicious burst of sweet and tangy flavor, a naturally intense blueberry taste that's hard to match.

ANTIOXIDANT POWER

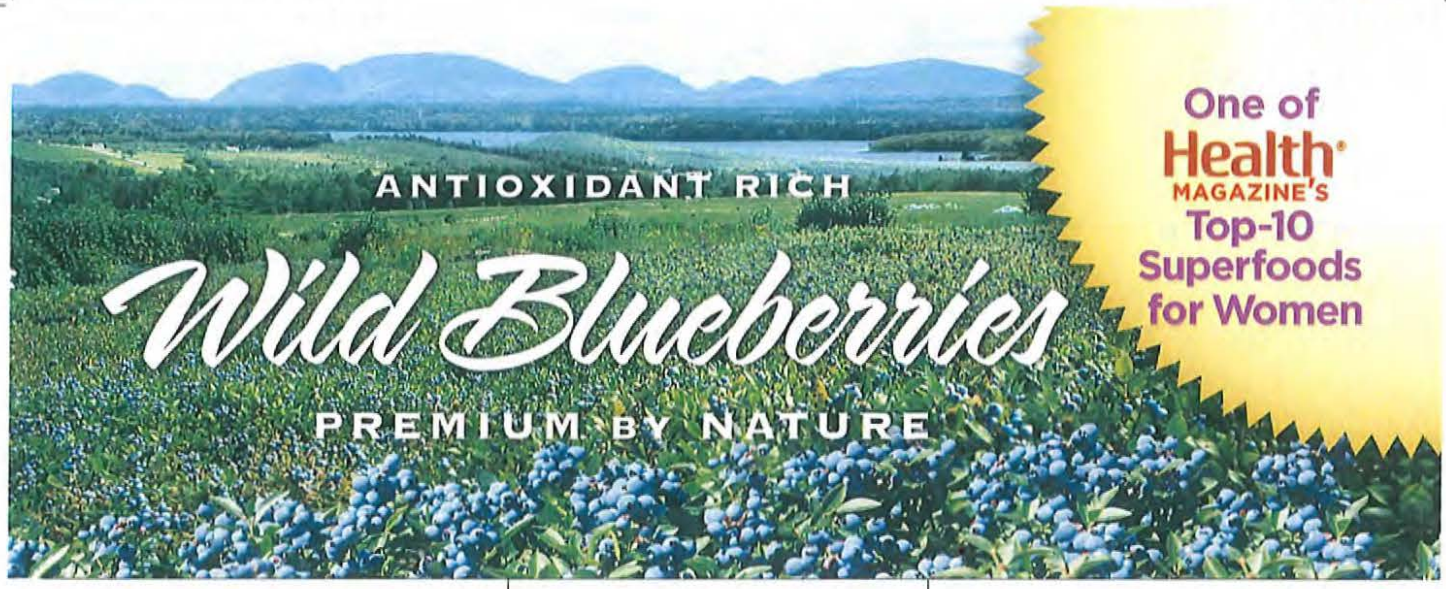
Nature endowed Wild Blueberries with more antioxidant capacity per serving than most other fruit ingredients, making them a powerful anti-aging superfruit. This gives your products a distinctive "health halo" in today's marketplace.

SUPERIOR PERFORMANCE

Versatile Wild Blueberries add flavor and health functionality while maintaining their taste, texture, shape and deep blue color. And they freeze perfectly with quality and nutritional value intact.

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE™

Learn more about the premium advantages of Wild Blueberries at
WILDBLUEBERRIES.COM



One of Health® MAGAZINE'S Top-10 Superfoods for Women

Special Size

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Antioxidant Power

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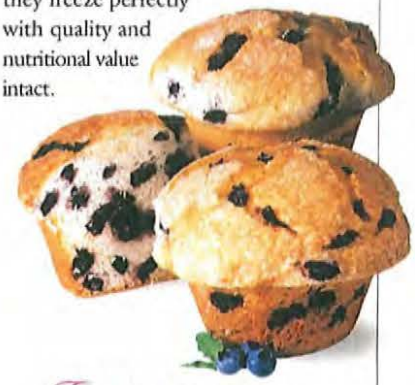

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ANTIOXIDANT RICH WILD BLUEBERRIES PREMIUM BY NATURE™

Learn more about the premium advantages of Wild Blueberries.

WILDBLUEBERRIES.COM

The Power of Blue®

Frozen Wild Blueberries. Super Food, Super Sales!

Frozen Wild Blueberries are helping to heat up sales in the Frozen Fruit Case. That's because your customers appreciate the powerful health benefits and extraordinary value of these tasty, little antioxidant-rich berries. Convenient, easy to use and just as nutritious as fresh, Frozen Wild Blueberries are the "blue" superfruit your customers love year-round.

The Jan/Feb 2010 issue of Health Magazine names Wild Blueberries a Top-10 SuperFood for Women—news that will drive customers to your frozen fruit case!

Not Just Blueberries, Wild Blueberries!

Not all blueberries are alike. In fact, the Wild Ones have more flavor, more versatility and more beneficial antioxidants per serving than cultivated blueberries. So help your customers get the **Power of Blue** every day with Frozen Wild Blueberries.

Making the Case for Frozen Fruit

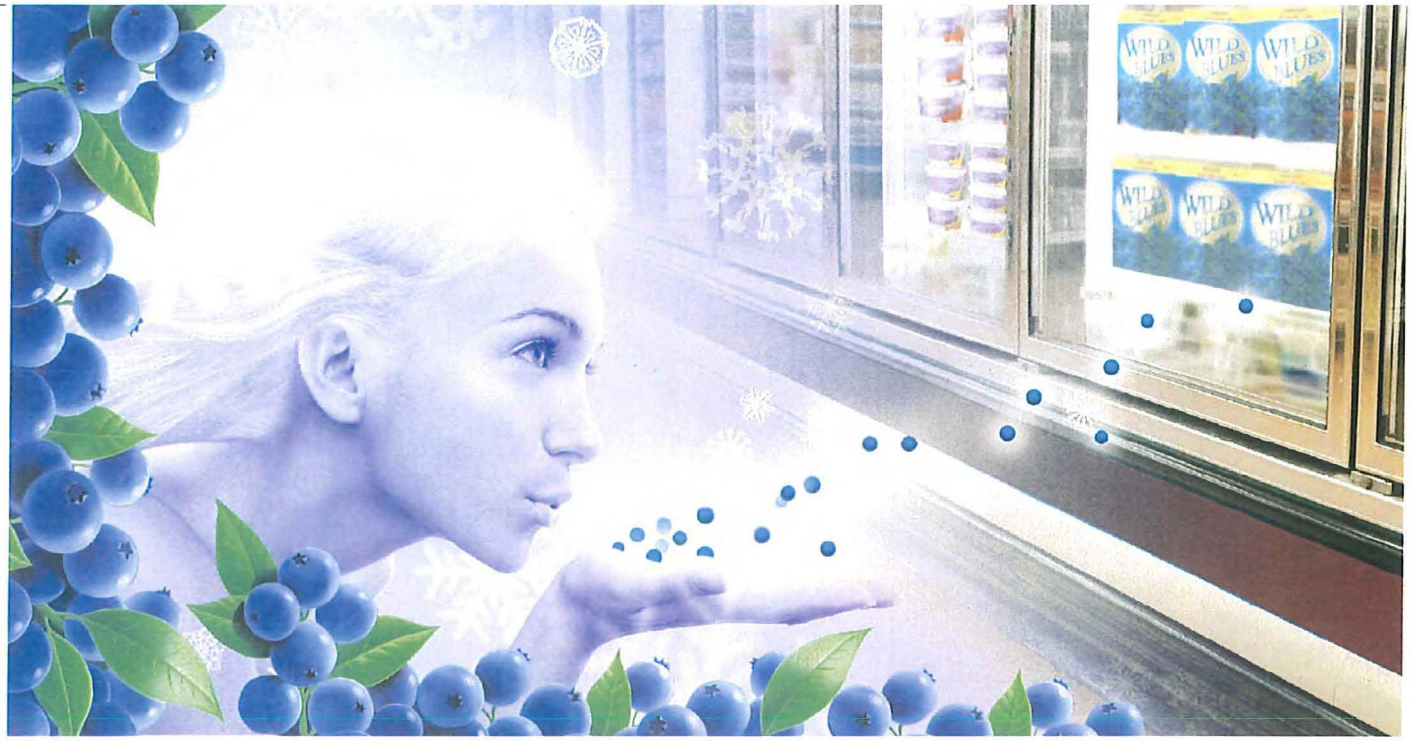
Today's consumers are tuned into the advantages of colorful frozen fruits like Wild Blueberries. Now, thanks to ads and stories in magazines like *Health*, they'll be looking for Frozen Wild Blueberries where they shop. So get ready! Contact your supplier to be sure you have Wild Blueberries in your Frozen Fruit Case.

ANTIOXIDANT RICH WILD BLUEBERRIES PREMIUM BY NATURE

wildblueberries.com

Not just blueberries, Wild Blueberries!


The Power of
Blue®
Frozen Wild Blueberries.
Nature's Antioxidant Superfruit!
In the spectrum of healthy superfoods, antioxidant-rich Wild Blueberries stand out — for their delicious taste, small size and big health benefits. Head to your supermarket frozen fruit case for your Daily Dose of Blue.® Frozen Wild Blueberries — easy, convenient and just as nutritious as fresh!
ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE
wildblueberries.com
FROZEN FRUIT
WILD BLUES
fruits & veggies more matters.
©2010 Wild Blueberry Association of North America
Not just blueberries, Wild Blueberries!



Mother Nature put Wild Blueberries on Earth to be Frozen.

So naturally, you'll only find them in the supermarket frozen fruit case. Frozen Wild Blueberries are the little ones with the great big taste. Packed with antioxidants, they're one of *Health* magazine's Top-10 Superfoods for Women. Easy, convenient and just as nutritious as fresh!

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE

wildblueberries.com

WILD BLUEBERRIES

MORE BANG FOR YOUR BERRY

NATURE'S PREMIUM SUPERFRUIT INGREDIENT

MORE REASONS TO GO WILD

MORE BERRIES

Naturally smaller Wild Blueberries deliver more than twice the number of berries per pound than cultivated blueberries.

2X

MORE PERFORMANCE

Wild Blueberries add flavor while better maintaining their shape, texture, color and outstanding nutritional value.

MORE FLAVOR

A variety of sweet and tangy flavors combine to create a more intense Wild Blueberry taste that cultivated blueberries simply can't match.

MORE ANTIOXIDANT POWER

Wild Blueberries have more total antioxidant capacity as measured by ORAC (Oxygen Radical Absorbance Capacity) than most other fruits—including cultivated blueberries!*

MORE NATURAL GOODNESS

From the fields and barrens of Downeast Maine and Canada comes a blueberry with more of Nature's wild advantages.

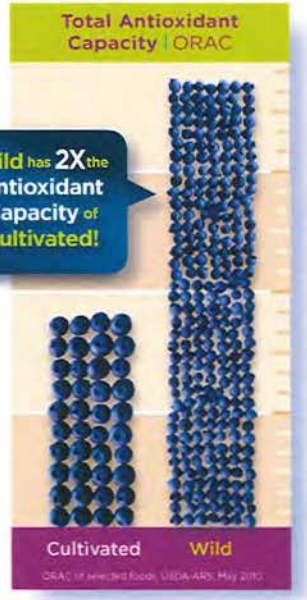
LEARN MORE ABOUT THE WILD ADVANTAGES OF WILD BLUEBERRIES AT WILDBLUEBERRIES.COM

ANTIOXIDANT RICH WILD BLUEBERRIES PREMIUM BY NATURE®

For a Better Blueberry, Go Wild!

Frozen Fresh Wild Blueberries!

Wild has MORE of what shoppers love about blueberries.



MORE Antioxidant Power

When asked what makes fruits and veggies healthy, over 80% of moms said **antioxidants.*** So give your shoppers more of what they're looking for: not just blueberries, Wild Blueberries—The Antioxidant Superfruit.

MORE Taste

Wild Blueberries are a mix of sweet and tangy varieties, delivering a delicious taste that cultivated blueberries can't match.

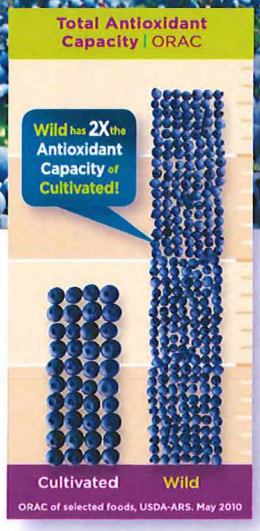
GO WILD in your Freezer Case

Stock the better blueberry! The little Wild Ones from Downeast Maine and Canada. For more information, visit WildBlueberries.com or email us at wildblueberries@gwi.net.

*Gen X/Y Moms Study, Produce for Better Health Foundation, March 2011

Frozen Fresh Wild Blueberries!

Wild has MORE of what shoppers love about Blueberries.



◂ MORE Antioxidant Power

When asked what makes fruits and veggies healthy, over 80% of moms said **antioxidants**.* So give your shoppers more of what they're looking for: not just blueberries, Wild Blueberries—The Antioxidant Superfruit.

◂ GO WILD For a Better Store Brand Blueberry

Choose Wild for your frozen blueberry. For more information, visit WildBlueberries.com or email wildblueberries@gwi.net.

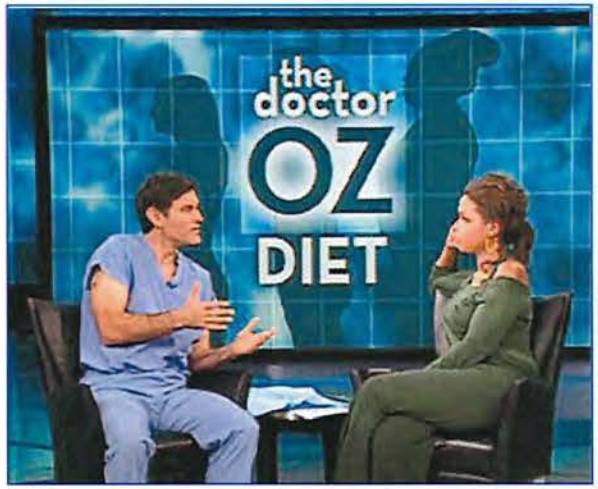
MORE Taste ▸

Wild Blueberries are a mix of sweet and tangy varieties, delivering a delicious taste that cultivated blueberries can't match.

ANTIOXIDANT RICH WILD BLUEBERRIES PREMIUM BY NATURE®

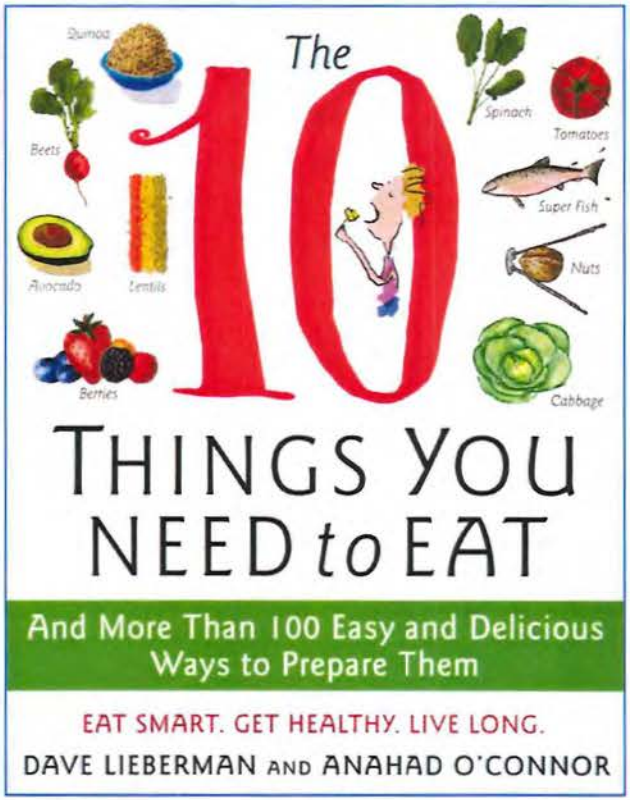
*Gen X/Y Moms Study, Produce for Better Health Foundation, March 2011

Healthy Doses of Wild PR



Healthy Doses of Wild PR

Satellite Media Tour



- Aired in 18 TV and 10 Radio Markets
- 10 million audience

ANTIOXIDANT RICH WILD BLUEBERRIES PREMIUM BY NATURE

Healthy Doses of Wild PR

Food

Wild ABOUT BLUEBERRIES

10135: Wild About Blueberries

All materials courtesy of Wild Blueberry Association

FAMILY FEATURES

Food Page Feature

- 217 newspaper placements
- 8.3 million audience
- 422 online placements
- 15 MM online impressions

23.3 million total impressions!

Healthy Doses of Wild PR

fruits & veggies more matters®

Radio Public Service Announcement

- *Breaking the Frozen Barrier*
- 172 stations nationwide
- 71 markets/8 of the top 10
- 14,204 airings
- 31.2 million impressions
- $745,000 media value!

Excellent results far surpassing industry standard 10% return

ANTIOXIDANT RICH WILD BLUEBERRIES PREMIUM BY NATURE

Healthy Doses of Wild PR

Health & Wellness Day

- Deepak Chopra
- Dr. Mehmet Oz
- Bobby Flay

TimesTalk Sponsorship

Healthy Doses of Wild PR

Food for Your Whole Life Health Symposium

- NYC Event Sponsorship
- California Walnuts Hosted
- Public, Health Professionals & Media
- High Profile Speakers
- Attendance exceeded 1,000

Healthy Doses of Wild PR

Chef Partnerships

- Jonathan Cartwright of White Barn Inn/Kennebunkport
- Spring Weekend TV Filming
- 9 million viewers

- Mark Gaier of Arrows Restaurant in Ogunquit
- 2010 James Beard Best Chef of the Northeast
- Portland's WCSH6 News Magazine 207

Healthy Doses of Wild PR

National Radio Pitch

- Pitched Nutrition Advisor Susan Davis, MS RD to national radio outlets as health and wellness expert
- Targeted national food and health programming
- Long format interviews allowed for Q & A related to nutrition, antioxidants, research studies, benefits of frozen fruit, and Wild vs. cultivated

Healthy Doses of Wild PR

Bar Harbor Research Summit

- National press release
- Important diabetes study results presented by Summit attendee Dr. William Cefalu of Pennington Biomedical Research Center/Louisiana State University

For Immediate Release
September 16, 2010

Contact:
Thom Householder
Front Burner PR
(207) 699-5501
thom@frontburnerpr.com

NEW RESEARCH SHOWS RISK OF DIABETES MAY BE REDUCED BY EATING BLUEBERRIES

Portland, ME — A breakthrough research study has found that including regular servings of blueberries in one's diet can have a positive impact on people at risk for Type 2 diabetes, the most common form of diabetes that affects millions of Americans. The study, led by Dr. April Stull and Dr. William T. Cefalu of the Pennington Biomedical Research Center at Louisiana State University, adds new information to the body of research supporting the benefits of making blueberries a regular part of a healthy diet.

Published in the October issue of *The Journal of Nutrition* (http://jn.nutrition.org), Dr. Cefalu's study found that daily consumption of whole blueberries helped people with a high risk for Type 2 diabetes reduce that risk. The bioactives in blueberries increased the participants' insulin sensitivity, a key factor in preventing Type 2 diabetes. The reduced risk for diabetes was observed in both men and women, according to the study.

"To our knowledge, this is the first reported human study that evaluated the effect of daily dietary supplementation with bioactives in blueberries on whole-body insulin sensitivity in obese, non-diabetic, and insulin-resistant men and women with such precise metabolic techniques," wrote Dr. Cefalu.

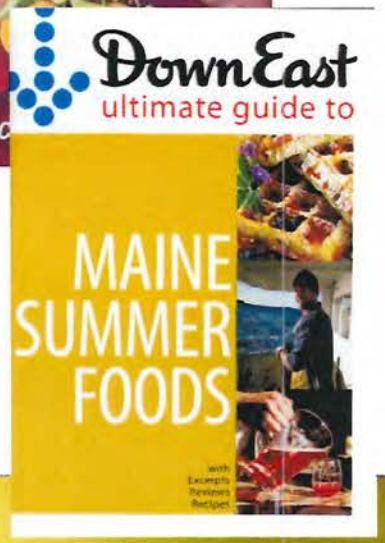
"Our data suggested that the inclusion of blueberries in the diet of our treatment group as compared to a control group had favorable effects on factors related to the development of diabetes," noted Cefalu, internationally regarded as a leading diabetes expert. "Diabetes is increasingly a concern in our population, and people should take steps to limit their risk. The evidence continues to grow regarding how effective diet can be in addressing conditions that we observe to be present in pre-diabetetic states."

Previous research and press accounts about blueberries and in particular Wild Blueberries also have shined a spotlight on how eating antioxidant-rich Wild Blueberries offers numerous potential health benefits, including lowering the risk of cardiovascular disease, preventing memory loss, lowering blood pressure, fighting wrinkles, boosting immune systems, and fighting the effects of aging.

- more -

Healthy Doses of Wild PR

CBS 6
WTVR.COM • RICHMOND, V



FOX 11
LOS ANGELES

abc 9
WCPO

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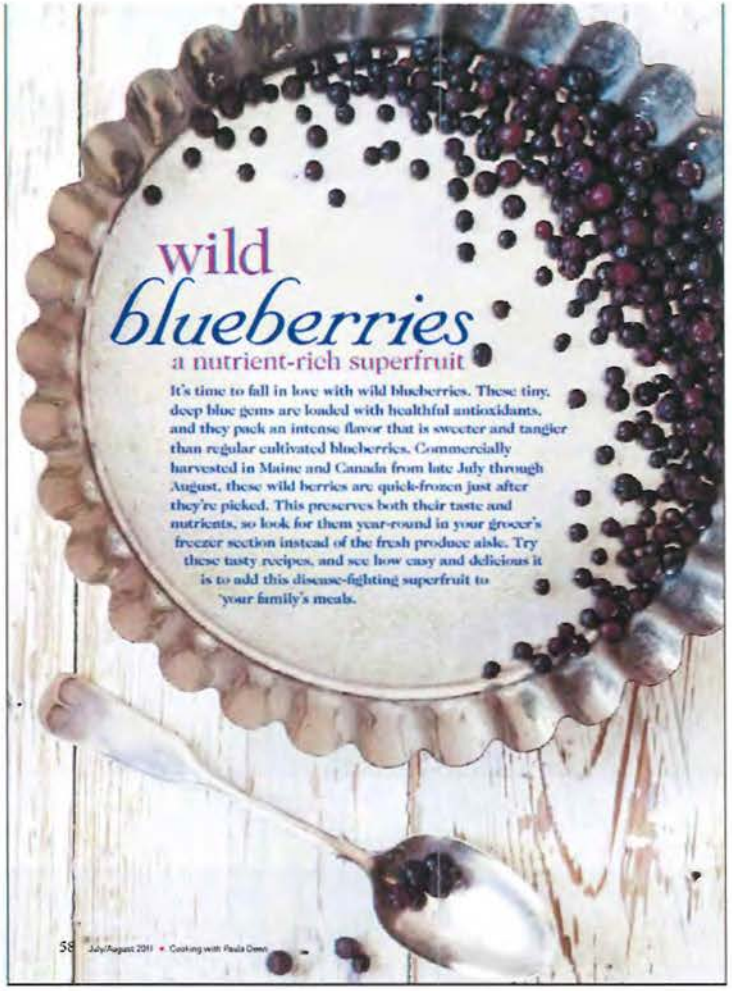
5 NEWS FIRST

AARP
HOME
MEMBER BENEFITS
HEALTH
BULLETIN
Health Discovery
Blueberries May Lower Blood Pressure

Healthy Doses of Wild PR

Dr. Mary Ann Lila on *Dr Oz.*
Cancer Protection from the "Wild"

Healthy Doses of Wild PR



Paula Deen

Fall in Love with Wild Blueberries

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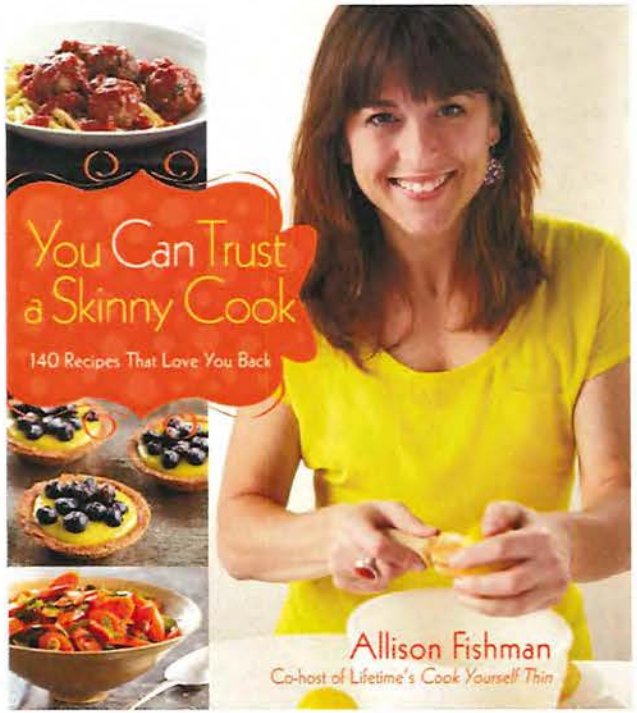
Healthy Doses of Wild PR



Broadcast Media Tour with *Allison Fishman*.
"You Can Trust A Skinny Cook"

ANTIOXIDANT RICH WILD BLUEBERRIES PREMIUM BY NATURE

Web Marketing Highlights

Web Marketing Highlights

Web Advertising

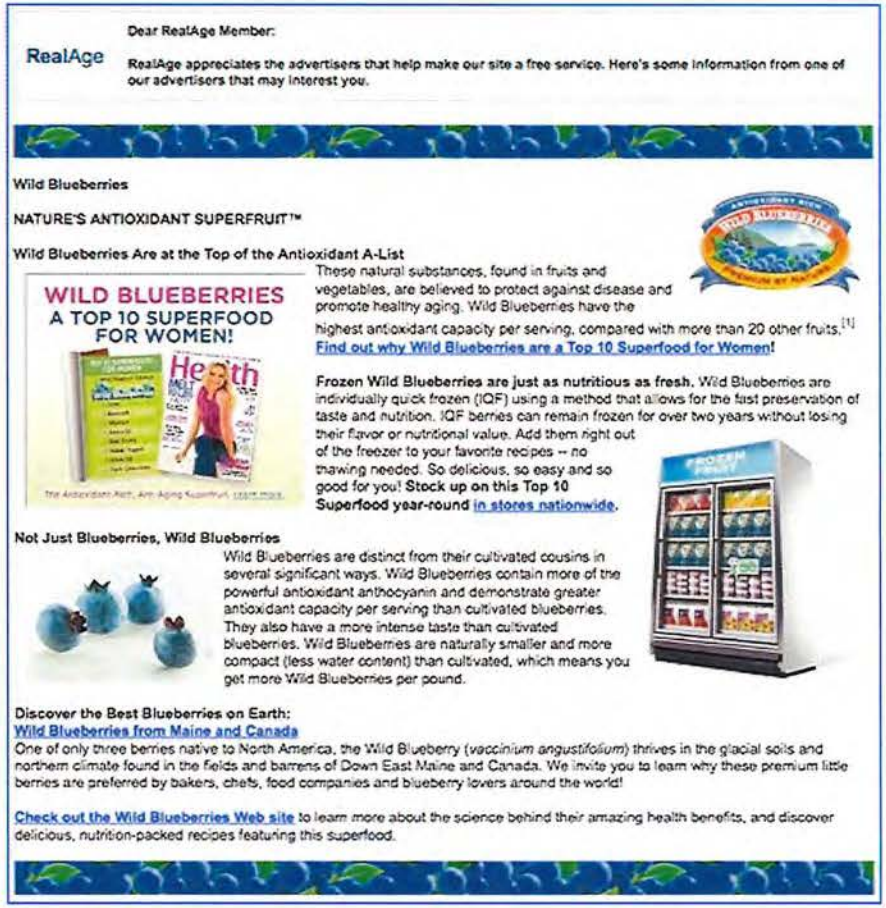
- Epicurious.com - premier award winning food Web site
- More than 25,000 professionally tested recipes drawing from Gourmet and Bon Appetit, plus web-exclusive recipes from renowned sources
- 4-week promotion
- Features frozen fruit message and Maine getaway
- Designed to build brand awareness and garner new subscriber emails

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE

Web Marketing Highlights

Real Age

- Site founded by Oz and Roizen
- Tip-of-Day and Targeted Emails
- Opt-in recipients/receptive audience
- Designed to build brand awareness



RealAge

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Wild Blueberries

NATURE'S ANTIOXIDANT SUPERFRUIT™

Wild Blueberries Are at the Top of the Antioxidant A-List

WILD BLUEBERRIES
A TOP 10 SUPERFOOD FOR WOMEN!

These natural substances, found in fruits and vegetables, are believed to protect against disease and promote healthy aging. Wild Blueberries have the highest antioxidant capacity per serving, compared with more than 20 other fruits.[1] Find out why Wild Blueberries are a Top 10 Superfood for Women!

Frozen Wild Blueberries are just as nutritious as fresh. Wild Blueberries are individually quick frozen (IQF) using a method that allows for the fast preservation of taste and nutrition. IQF berries can remain frozen for over two years without losing their flavor or nutritional value. Add them right out of the freezer to your favorite recipes -- no thawing needed. So delicious, so easy and so good for you! **Stock up on this Top 10 Superfood year-round** in stores nationwide.

Not Just Blueberries, Wild Blueberries

Wild Blueberries are distinct from their cultivated cousins in several significant ways. Wild Blueberries contain more of the powerful antioxidant anthocyanin and demonstrate greater antioxidant capacity per serving than cultivated blueberries. They also have a more intense taste than cultivated blueberries. Wild Blueberries are naturally smaller and more compact (less water content) than cultivated, which means you get more Wild Blueberries per pound.

Discover the Best Blueberries on Earth:
Wild Blueberries from Maine and Canada
One of only three berries native to North America, the Wild Blueberry (*vaccinium angustifolium*) thrives in the glacial soils and northern climate found in the fields and barrens of Down East Maine and Canada. We invite you to learn why these premium little berries are preferred by bakers, chefs, food companies and blueberry lovers around the world!

Check out the Wild Blueberries Web site to learn more about the science behind their amazing health benefits, and discover delicious, nutrition-packed recipes featuring this superfood.

Web Marketing Highlights

NYT.com Rich Media Campaign

Email

Landing Page

Email

Campaign Performed 375% Better Than Industry Standard

ANTIOXIDANT RICH WILD BLUEBERRIES PREMIUM BY NATURE

Web Marketing Highlights

Wild and the Skinny Cook Campaign

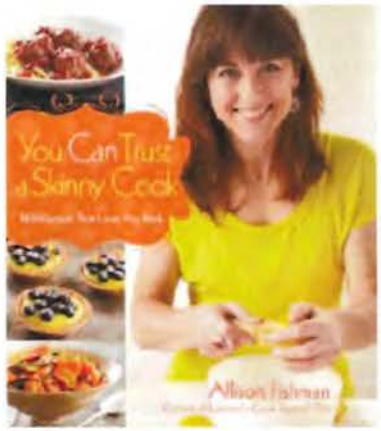
Web Marketing Highlights

Eat Healthy Twitter Party

MAY 11th

Learn to "Trust a Skinny Cook" during our May 11th Twitter Party with Lifetime's Cook Yourself Thin Host & Cookbook Author, Allison Fishman

by SpruceTV



As the co-author of the bestseller Cook Yourself Thin and the co-host of the Lifetime show by the same name, Allison Fishman knows a thing or two about healthy cooking. In YOU CAN TRUST A SKINNY COOK Fishman teaches home cooks how to stay trim—without giving up the good things in life. This book will equip readers with a variety of cooking techniques that allow them to make smart and tasty choices in the kitchen.

Fishman offers up 140 recipes that cover every meal of the day, from soups and salads, to main courses and side dishes—even desserts and snacks! Each recipe includes a complete nutritional profile, so people following Weight Watchers, South Beach, or other programs can easily incorporate these meals into their daily routine. Recipes include handy "Kitchen Tips" that make cooking simple, and "Skinny Kitchen Tips" offer suggestions on how to cut calories without losing flavor.

Check out our video below of Allison making her "Blueberry Bread pudding with Peaches"!

twitpic

- Promote the party with food & health personalities
- Invite the Guests
- Serve-up healthy conversation

Web Marketing Highlights

Web traffic from Wild and Skinny Cook Activity:

- 60% increase in visits, 80% increase in page views, 38% increase in blog visitors
- "Where to buy page" edged out "health benefits" and "recipes" as most popular page after home page…qualified visitors wanting to buy!

Web Marketing Highlights

Social Media and Search Campaigns

Social

Social

Organic Search

Paid Search

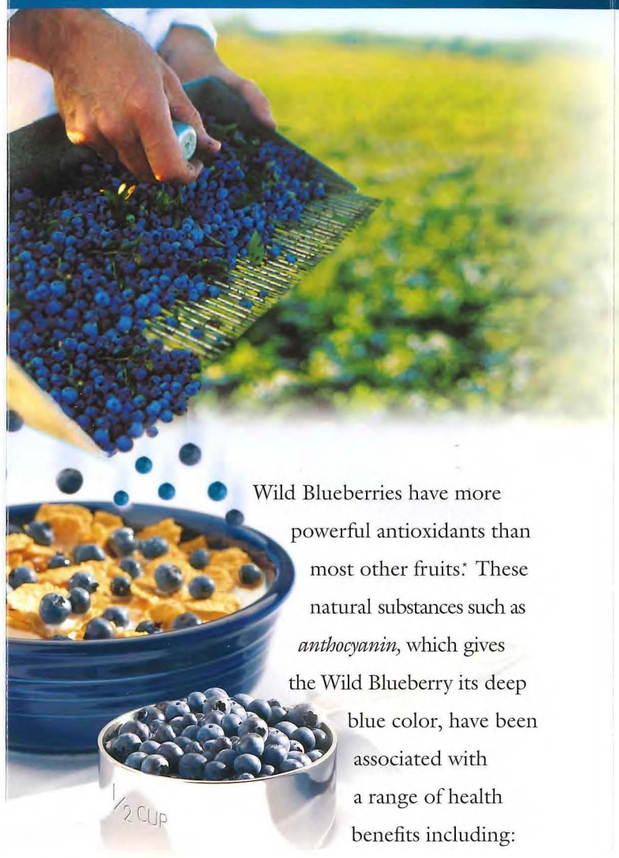
ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE

8 EASY, HEALTHY AND DELICIOUS
WILD BLUEBERRY RECIPES

THE POWER OF *Blue*®

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE®

THE *Benefits* OF *Blue*



Wild Blueberries have more powerful antioxidants than most other fruits.* These natural substances such as *anthocyanin,* which gives the Wild Blueberry its deep blue color, have been associated with a range of health benefits including:

BRAIN HEALTH—Blueberries may improve motor skills and reverse age-related short-term memory loss.

CANCER PREVENTION—Blueberry compounds may inhibit all stages of cancer.

HEART HEALTH—Blueberries may protect against heart disease and damage from stroke.

*Journal of Agricultural and Food Chemistry, 2004, 52:4026-4037

URINARY TRACT HEALTH—Like cranberries, blueberries may help prevent urinary tract infections.

VISION HEALTH—Blueberries may improve night vision and prevent tired eyes.

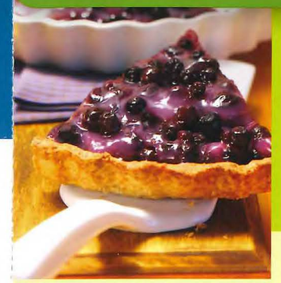
THE POWER OF BLUE RIGHT OUT OF THE FREEZER

Wild Blueberries are available fresh during the late summer months and frozen all year long. The berries are fresh-frozen at harvest so they retain their great taste, superior quality and healthy antioxidant goodness. In fact, the FDA has concluded that frozen fruits and vegetables are just as healthy as fresh, making Frozen Wild Blueberries a smart choice all year long.

- ADD A HALF-CUP TO YOUR MORNING CEREAL
- TOSS THEM INTO PANCAKE OR MUFFIN BATTER
- SPRINKLE THEM ON SALADS
- TRY OUR RECIPES OR YOUR OWN FAVORITES

Frozen **WILD BLUEBERRIES** are conveniently located in your grocer's frozen fruit section.

CREAMY WILD BLUEBERRY PIE



CRUST INGREDIENTS
- Prepared frozen, rolled pie crust or your favorite single crust recipe

TOPPING INGREDIENTS
- 5 cups frozen Wild Blueberries
- ¾ cup sugar
- 3 tablespoons cornstarch
- 1 ½ tablespoons lemon juice
- 1 cup low-fat sour cream

CRUST PREPARATION
Roll out dough on floured work space and press into a tart pan. Prick crust thoroughly on bottom and sides with a fork and bake for 5-10 minutes at 400°F until golden color.

FILLING PREPARATION
Combine berries with sugar over very low heat. Berries will thaw and sugar will melt. Combine cornstarch with small amount of water to make a slurry and add to berry mixture. Stir thoroughly to blend cornstarch mixture evenly. Cook until thickened and sauce is clear, 3-5 minutes. Remove from heat and cool to room temp. Stir in lemon juice and fold in low-fat sour cream. Pour into cooled tart crust and refrigerate for at least an hour. Served chilled. Serves 8

Optional: sprinkle with ½ cup thinly sliced roasted almonds before serving

Preparation time: 45 minutes, plus time to cool

Nutritional Information Per Serving: 272 calories, 10g fat, 163mg sodium, 48g carbohydrates, 4g fiber, 2g protein

HEALTHY RECIPES AND MORE AT: **WWW.WILDBLUEBERRIES.COM**

GRILLED CHICKEN
with Wild Blueberry Grape Sauce

INGREDIENTS
- 4 boneless skinless chicken breasts
- 1 tablespoon canola oil
- salt and pepper to taste
- 1 small red onion, finely diced
- ¾ cup grape juice
- 4 teaspoons cornstarch
- 2½ cups Wild Blueberries
- 2 teaspoons balsamic vinegar
- pinch granulated sugar
- 4 stalks celery, finely chopped

PREPARATION
Drizzle chicken breasts with 2 teaspoons of the oil and sprinkle with salt and pepper. Heat grill pan or nonstick skillet over medium high heat and cook chicken breasts, turning once for about 12 minutes or until no longer pink inside. Keep warm. In another nonstick skillet, heat remaining oil over medium heat and cook onions for about 8 minutes or until softened and golden. In small bowl, whisk together ¼ cup of the grape juice and cornstarch; set aside. Add remaining grape juice and Wild Blueberries to onion and bring to boil. Stir in cornstarch mixture and cook, stirring for 1 minute or until thickened. Add balsamic vinegar, sugar and salt to taste. Thinly slice chicken breasts and serve with Wild Blueberry sauce and celery for garnish. Optional: Substitute red wine for grape juice for a savory taste.

Preparation time: 10 minutes. Cook time: 25 minutes. Serves 4.

Nutritional Information Per Serving: 413 calories, 10g fat, 437mg sodium, 27g carbohydrates, 5g fiber, 54g protein

HEALTHY RECIPES AND MORE AT: **WWW.WILDBLUEBERRIES.COM**

WILD BLUEBERRY GINGERED LEMON MUFFINS

INGREDIENTS
- 6 cups cake flour
- 2 tablespoons baking powder
- 2 teaspoons baking soda
- ½ teaspoon salt
- 2 cups low-fat buttermilk
- 1 ½ cups (12 oz) egg substitute
- 1 ½ cups granulated sugar
- ½ cup canola oil
- 4 cups Wild Blueberries
- ⅓ cup (3 oz) crystallized ginger, chopped
- 2 tablespoons lemon zest
- ⅓ cup granulated sugar

PREPARATION
In bowl combine flour, baking powder, baking soda and salt; reserve. In another bowl beat together buttermilk, egg substitute, sugar and oil; stir into flour mixture just to blend. Fold in Wild Blueberries, ginger and lemon zest. Scoop ¼-cup batter into each greased ½-cup muffin tin. Sprinkle each muffin with sugar. Bake in 400°F conventional oven or 375°F convection oven 18 to 22 minutes or until firm to the touch. Serve warm. Yields approximately 36 muffins.

Nutritional Information Per Serving:
153 calories, 4g fat, 216mg sodium, 38g carbohydrates, 1g fiber, 3g protein

HEALTHY RECIPES AND MORE AT: **WWW.WILDBLUEBERRIES.COM**

WILD BLUEBERRY SMOOTHIE

INGREDIENTS
- 1 cup frozen Wild Blueberries
- 1 ripe banana, peeled and cut in pieces
- 1 cup vanilla yogurt
- 1 tablespoon honey (more if desired)
- ½ cup orange juice
- mint leaves for garnish

PREPARATION
Place all ingredients in blender and mix until creamy. If too thick add small amounts of juice or milk until desired consistency. 3 (12 ounce) servings

Tip: Vary smoothie ingredients for added protein and vitamins. Try silken firm tofu, protein powder, a sprinkle of wheat germ or flax seed, or a variety of 100% fruit juices

Nutritional Information Per Serving:
162 calories, 1g fat, 47mg sodium, 36g carbohydrates, 3g fiber, 4g protein

HEALTHY RECIPES AND MORE AT: **WWW.WILDBLUEBERRIES.COM**

Wild Blueberry Pear Crumble

Ingredients

- 2 Anjou pears, peeled and cored
- 3 ¾ cups Wild Blueberries
- 3 tablespoons granulated sugar
- ⅔ cup all purpose flour
- ¼ cup walnut halves, finely chopped
- 3 tablespoons granulated sugar
- 3 tablespoons butter, melted
- ¾ cup whipping cream
- 2 teaspoons vanilla extract
- 1 tablespoon cinnamon

Preparation

Dice pears and place in bowl. Add Wild Blueberries and sugar and stir to combine. Divide mixture among four 2-cup heatproof ramekins. In bowl, combine flour, walnuts and sugar. Drizzle butter over top and stir until coarse crumbs form. Sprinkle evenly over top of fruit mixture. Bake in 400°F (200°C) oven for about 20 minutes or until fruit is bubbly and top is golden. Let cool slightly. Meanwhile, whip cream, vanilla extract and cinnamon until firm peaks. Serve with Pear Crumble. Preparation Time: 15 minutes. Cook Time: 20 minutes. Serves 4.

Nutritional Information per Serving
522 calories, 33g fat, 50g carbohydrates, 5g protein

Savory Salad
with Goat Cheese and Wild Blueberry Sauce

Ingredients

- 2 large or 3 medium shallots
- 2 tablespoons olive oil
- 1 ½ cups frozen Wild Blueberries
- 3 ounces water
- 3 tablespoons Grey Poupon mustard
- 1 tablespoon peach or apricot preserves
- 1 tablespoon cornstarch
- ½ teaspoon salt
- 2 endives
- 1 radicchio
- 2 yellow peppers
- 2 tablespoons white wine vinegar
- ¼ teaspoon salt
- ⅛ teaspoon pepper or more to taste
- 1 pinch sugar
- 3 tablespoons olive oil
- ½ teaspoon ground coriander
- 6 2-inch rounds of goat cheese ½-inch thick (about 6 ounces)
- 2 tablespoons powdered sugar

Preparation

Sauce: Peel and dice shallots. Sauté in 2 tablespoons of olive oil until softened about 3–5 minutes. Stir in berries, 3 ounces of water, mustard and preserves. Cook stirring until simmer. Simmer 3–5 minutes. Mix cornstarch with a little cold water until the mixture is smooth. Add to Wild Blueberry mixture, stirring well. Bring to a boil, cook for 2–3 minutes. Add salt. Let cool slightly. **Salad:** Cut endive into bite-size cubes. Slice yellow peppers into thin strips. Cut radicchio into bite-sized pieces. Mix vinegar, salt, pepper, sugar and olive oil in big bowl. Add salad ingredients and toss well. **Cheese:** Dredge top of goat cheese rounds in powdered sugar. Place goat cheese on baking tray covered with foil. Brown slightly under preheated grill, 1 to 2 minutes. Remove and sprinkle with coriander. Preparation time approximately 35 minutes.

Nutritional Information per Serving
255 calories, 10g fat, 12g carbohydrates, 9g protein

Wild Blueberry Canapés

Ingredients

- 2 sheets filo pastry
- ½ cup unsalted butter, melted
- 12 ounces of Brie
- ½ small red onion, finely chopped
- ⅔ cup virgin olive oil
- 1 tablespoon sugar
- 2 teaspoons balsamic vinegar
- ¼ cup dried Wild Blueberries (soaked in boiling water for 20 minutes and drained)
- 1 head of curly leaf lettuce
- 1 bunch chives

Preparation

Pastry: Preheat oven to 350°F. Spread one sheet of filo pastry on a work surface, brush with melted butter. Place a second sheet over the first and brush with more butter. Cut the filo pasty in half, brush one surface with butter and place one on top of the other. Cut out into 1 ½" squares. Place squares onto a baking sheet and bake in preheated oven for 10-12 minutes until golden.

Relish: Heat the onion in oil for 5-10 minutes until soft. Add the sugar, vinegar and Wild Blueberries, bring to a fast simmer and reduce juices to a syrupy consistency. Allow to cool.

Assembly: Place a piece of lettuce onto each filo shape, position a cube of Brie on each, then top with a small heap of Wild Blueberry relish. Finish with a length of fresh chive. Makes 12 canapés

Nutritional Information per Serving
302 calories, 28g fat, 190mg sodium, 7g carbohydrates, 6g protein

Vegetable Couscous
with Wild Blueberries

Ingredients

- 1 cup vegetable stock
- 3 tablespoons olive oil
- 1 cup couscous
- 1 teaspoon grated lemon rind
- pinch ground cumin
- 2 carrots, diced
- 1 small zucchini, diced
- ¼ cup walnut halves, chopped
- 1 ¼ cups Wild Blueberries
- ½ cup cooked chickpeas
- salt and pepper to taste
- 4 sprigs each fresh cilantro and flat leaf parsley, chopped

Preparation

In small saucepan, bring vegetable stock and 2 tablespoons of the oil to boil. Add couscous, lemon rind and cumin; stir to combine. Remove from heat and cover; let stand for 5 minutes. Fluff with fork and scrape into large bowl.

Meanwhile, heat remaining oil in skillet over medium heat and cook carrots for 5 minutes or until softened. Add zucchini and cook for 3 minutes or until softened. Remove from heat and add walnuts. Add to couscous. Add Wild Blueberries and chickpeas to bowl. Season with salt and pepper to taste. Add cilantro and parsley and stir to combine well. Preparation Time: 20 minutes. Cook Time: 13 minutes. Serves 4

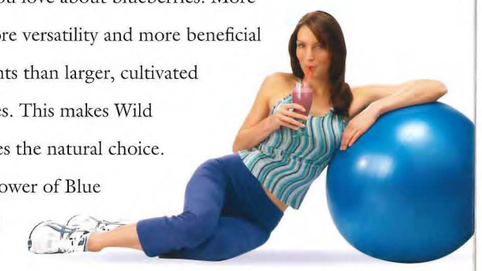
Nutritional Information per Serving
383 calories, 14g fat, 51g carbohydrates, 12g protein

Healthy Goodness from The Land of Wild Blueberries

Wild Blueberries grow naturally in the fields and barrens of Downeast Maine and Canada. One of three berries native to North America, the Wild Blueberry has long been prized for its nutritional and healing properties. As we learn more about the health benefits of this sweet and tangy fruit, one thing remains unchanged: Wild Blueberries are an extraordinarily delicious way to eat healthy!

The Best Blueberries on Earth

All blueberries are not alike! In fact, Wild Blueberries—the little ones with the great big taste—have more of what you love about blueberries: More flavor, more versatility and more beneficial antioxidants than larger, cultivated blueberries. This makes Wild Blueberries the natural choice. Get the Power of Blue every day!



ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE

WWW.WILDBLUEBERRIES.COM

DAILY *Dose* OF *Blue*®

ANTIOXIDANT-RICH WILD BLUEBERRIES

Wild Blueberries may be small but they pack a healthy punch! Rich in natural "blue" antioxidants and anti-inflammatories, Wild Blueberries have what it takes to help guard against cell damage that's associated with cancer, heart disease, Alzheimer's disease and the effects of aging—a great reason to get your Daily Dose of Blue!

At just 45 calories per half-cup serving, Wild Blueberries deliver substantial nutrients for every calorie consumed, making them a nutrient-rich fruit choice. Nutritionists agree, "more matters" when it comes to adding colorful fruits and vegetables to your diet. Just one-half cup satisfies one of your daily servings of colorful fruit, so get more of the Power of Blue with Wild Blueberries.

fruits & veggies more matters®

AND BE GOOD TO YOUR CELLS.

A serving of Wild Blueberries has more antioxidants than most other fruits. Why are antioxidants so important? Because they help guard against cell damage that's

associated with **CANCER, HEART DISEASE, ALZHEIMER'S** and other age-related health risks. Now that's protection every body can use. Eat Wild Blueberries, Nature's Antioxidant SuperFruit.™ Your cells will thank you.

NOT JUST BLUEBERRIES,

WILD BLUEBERRIES™

All blueberries are not alike! In fact, the Wild Ones, growing naturally in the fields and barrens of Downeast Maine and Canada, have more of what you love about blueberries. More flavor, more versatility and more beneficial antioxidants than their larger, cultivated cousins. This makes Wild Blueberries the natural choice for healthy eating every day.

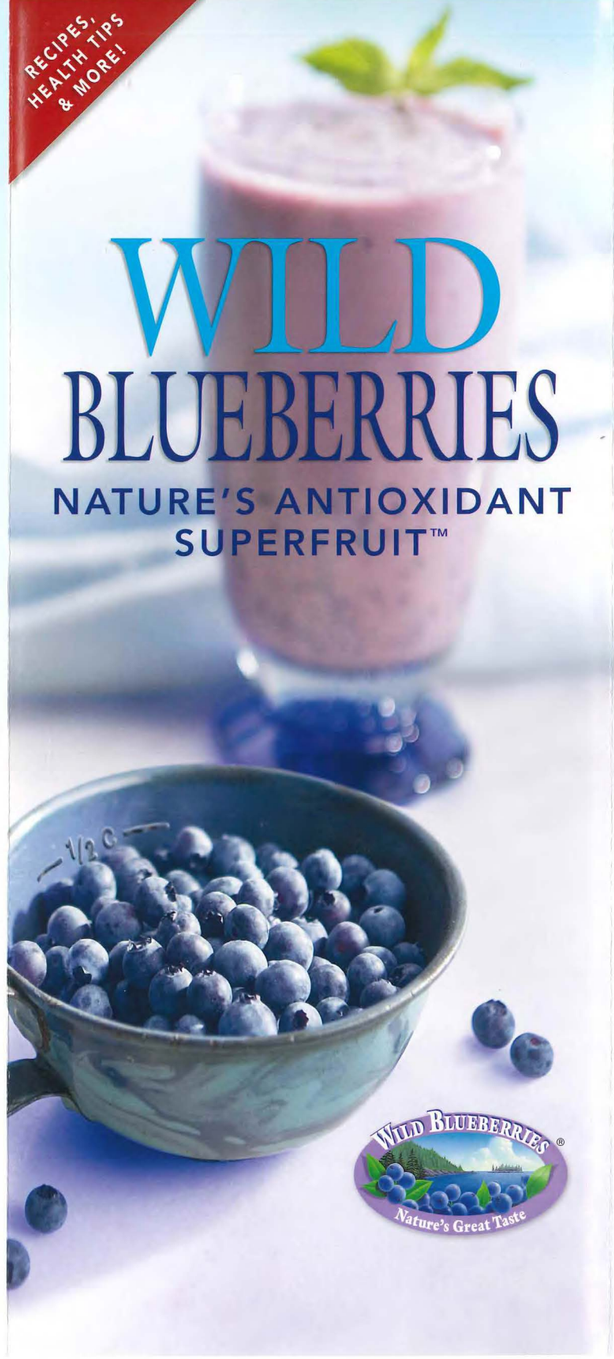
Wild Blueberries® Nature's Great Taste

wildblueberries.com

RECIPES, HEALTH TIPS & MORE!

WILD BLUEBERRIES

NATURE'S ANTIOXIDANT SUPERFRUIT™



Wild Blueberries® Nature's Great Taste

EAT WILD BLUEBERRIES...

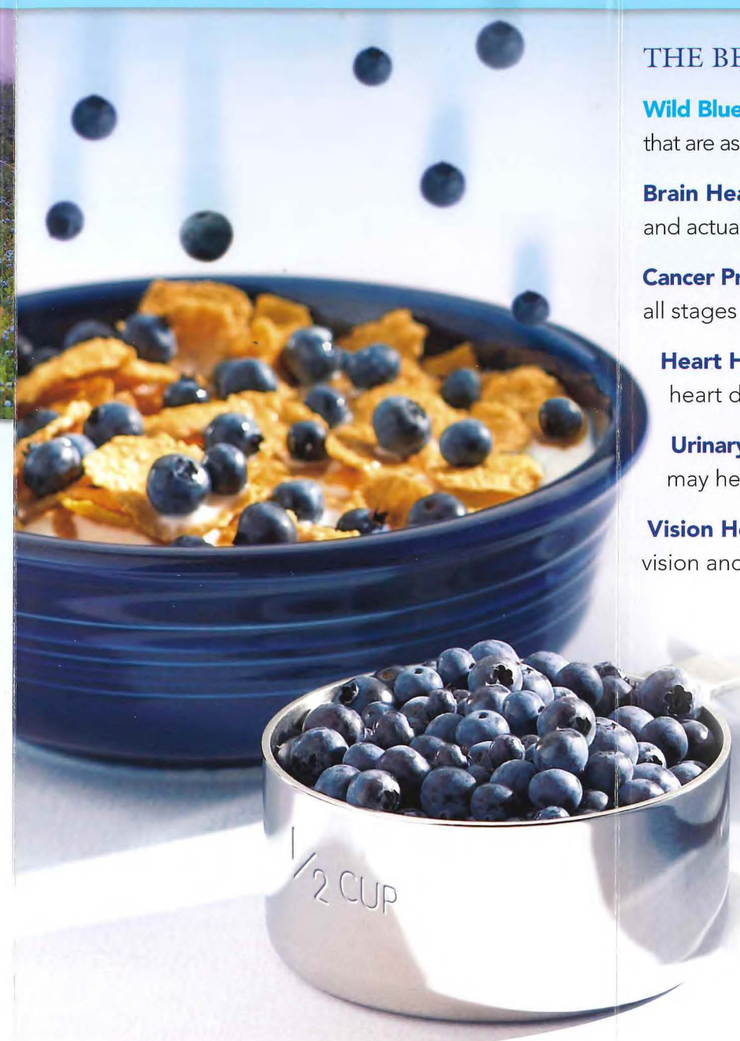
GET YOUR DAILY DOSE OF BLUE™

WILD BLUEBERRIES ARE NATURALLY NUTRIENT RICH

Nutrition experts agree, "more matters" when it comes to eating fruits and vegetables. In fact, a healthy diet rich in colorful fruits and veggies may help with weight management and may reduce the risk of some cancers, diabetes and other diseases.

fruits & veggies more matters™

A half-cup of Wild Blueberries is a delicious way to satisfy one of your daily servings of colorful fruit. At just 45 calories per serving, Wild Blueberries are packed with antioxidants and deliver substantial nutrients for every calorie consumed, making them a naturally nutrient-rich fruit choice.



THE BENEFITS OF BLUE

Wild Blueberries are rich in natural, blue antioxidants that are associated with a range of health benefits including:

Brain Health—Blueberries may improve motor skills and actually reverse age-related short-term memory loss.

Cancer Prevention—Blueberry compounds may inhibit all stages of cancer.

Heart Health—Blueberries may protect against heart disease and damage from stroke.

Urinary Tract Health—Like cranberries, blueberries may help prevent urinary tract infections.

Vision Health—Blueberries may improve night vision and prevent tired eyes.

Wild Blueberries have the highest antioxidant capacity per serving, compared with more than 20 other fruits.*

*Journal of Agricultural and Food Chemistry, 2004, 52:4026-4037

HEALTHY GOODNESS

RIGHT OUT OF THE FREEZER

Wild Blueberries are fresh-frozen at harvest, so they retain their great taste, superior quality and healthy antioxidant goodness. In fact, the FDA has concluded that frozen fruits and vegetables are just as healthy as fresh, making Frozen Wild Blueberries a smart choice all year long.

- Add a half-cup to your morning cereal
- Toss them into pancake or muffin batter
- Sprinkle them on salads
- Try our recipes or your own favorites

Enjoy the healthy goodness of Frozen Wild Blueberries every day!

Wild Blueberries with Roquefort and Celery

Ingredients

- 2 cups of frozen Wild Blueberries
- ½ cup walnuts
- ½ cup Roquefort or blue cheese, crumbled
- 1 bunch of celery
- 6 tablespoons of Cumberland Sauce

PREPARATION

Let Wild Blueberries defrost. Finely chop walnuts and roast them gently in a coated pan without fat. Divide Roquefort into bits. Clean and wash celery. Cut into 3-inch pieces. Fill celery pieces with combined mixture of Wild Blueberries, walnuts and cheese. Drizzle each filled celery piece with Cumberland Sauce.

CUMBERLAND SAUCE

- Juice and zest of ½ orange and ½ lemon
- 1 teaspoon currant jelly (or other fruit jelly)
- ⅓ cup of ruby port
- Pinch of cayenne

Combine all ingredients and simmer until reduced by ½ or until thickened enough to coat a spoon.

Preparation time: 20 minutes plus approximately 30 minutes defrosting time. Serves 6

Nutritional Information Per Serving (with sauce):
170 calories; 10 g fat; 230 mg sodium; 15 g carbohydrates; 4 g fiber; 4 g protein

Wild Blueberry Crisp

Crust Ingredients

- ½ cup light brown sugar
- 2 teaspoons cinnamon
- 1 teaspoon nutmeg
- ½ cup white flour
- ½ cup chopped pecans (optional)
- ½ cup rolled oats
- ⅛ teaspoon salt (optional)
- 3 tablespoons butter or soft margarine

Filling Ingredients

- 5 cups frozen Wild Blueberries
- ¼ cup sugar
- 1 cup diced, peeled apples (2 medium)
- ½ teaspoon grated lemon rind

PREPARATION

Preheat oven to 325°F.
Grease 8 x 8 x 2-inch pan. In a small bowl, combine Wild Blueberries, sugar, lemon rind and apples. Mix well and pour into prepared pan. In a medium bowl, combine brown sugar, cinnamon, nutmeg, flour, pecans, oats and salt. Rub in butter with your fingers until mixture resembles coarse crumbs. Spread evenly over Wild Blueberry filling and bake 45 minutes or until crust is brown. Serves 6

Nutritional Information Per Serving:
265 calories; 7 g fat; 67 mg sodium; 53 g carbohydrates; 7 g fiber; 2 g protein

Healthy recipes and more at: **wildblueberries.com**

Creamy Wild Blueberry Pie

Crust Ingredients

- Prepared frozen, rolled pie crust or your favorite single crust recipe

Topping Ingredients

- 5 cups frozen Wild Blueberries
- ¾ cup sugar
- 3 tablespoons cornstarch
- 1½ tablespoons lemon juice
- 1 cup low-fat sour cream

CRUST PREPARATION

Roll out dough on floured work space and press into a tart pan. Prick crust thoroughly on bottom and sides with a fork and bake for 5-10 minutes at 400°F until golden color.

FILLING PREPARATION

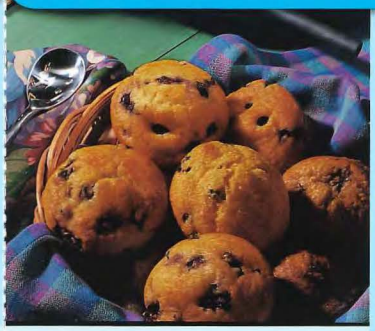
Combine berries with sugar over very low heat. Berries will thaw and sugar will melt. Combine cornstarch with small amount of water to make a slurry and add to berry mixture. Stir thoroughly to blend cornstarch mixture evenly. Cook until thickened and sauce is clear, 3-5 minutes. Remove from heat and cool to room temp. Stir in lemon juice and fold in low-fat sour cream. Pour into cooled tart crust and refrigerate for at least an hour. Served chilled. Serves 8

Tip: Optional—sprinkle with ½ cup thinly sliced roasted almonds before serving
Preparation time: 45 minutes, plus time to cool

Nutritional Information Per Serving:
272 calories; 10 g fat; 163 mg sodium; 48 g carbohydrates; 4 g fiber; 2 g protein

Healthy recipes and more at: **wildblueberries.com**

Wild Blueberry Walnut Bran Muffins



Ingredients

- 2 cups bran cereal
- 1¼ cups fat-free milk
- 1¼ cups all-purpose flour (can substitute with half whole wheat flour)
- ½ cup sugar
- 1 tablespoon baking powder
- ¼ teaspoon salt
- 1 large egg or 2 whites
- 1 teaspoon vanilla
- ¼ cup vegetable oil (such as Canola oil)
- 1½ cups walnuts
- 3 cups Wild Blueberries
- 3 tablespoons brown sugar (optional)

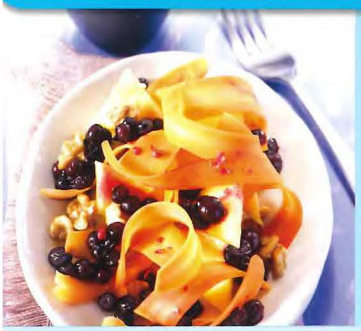
PREPARATION

Preheat oven to 375°F. In large bowl, combine bran cereal and milk. Let stand about 5 minutes or until softened. Stir together flour, sugar, baking powder and salt. Set aside. Add egg and oil to softened cereal mixture and mix thoroughly. Add flour mixture, stirring only until just combined. Do not beat. Fold in walnuts. Gently fold in Wild Blueberries. Portion evenly in 12, 2½-inch muffin tins coated with cooking spray. (Optional: sprinkle uncooked muffins with brown sugar.)
Bake 25-30 minutes. If frozen berries are used, add 5-10 minutes to cooking time. Serves 12

Nutritional Information Per Serving: 1 muffin (optional brown sugar not included)
280 calories; 16 g fat; 190 mg sodium; 36 g carbohydrates; 6 g fiber; 6 g protein

Healthy recipes and more at: **wildblueberries.com**

Carrot Salad with Wild Blueberries



Ingredients

- Juice of 1 lemon
- 4 teaspoons of maple syrup
- ½ teaspoon salt
- 1 cup diced red pepper
- 2 teaspoons olive oil
- 1½ cups frozen Wild Blueberries
- 1 bunch of carrots or 10 ounce bag of matchstick carrots
- ⅓ cup roasted walnuts
- ½ cup pineapple pieces

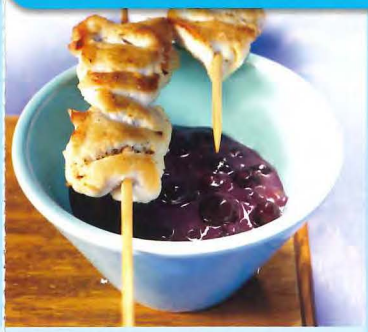
PREPARATION

Mix lemon juice with maple syrup, salt, pepper and oil. Add Wild Blueberries and let them defrost in the marinade. Peel carrots and either cut them into very thin slices or use prepared matchstick carrots. Make 8 carrot ribbons with a potato peeler for garnish. Chop walnuts and roast in a coated pan. Cut the pineapple into small cubes. Mix the carrots, walnuts and pineapple pieces and carefully bring them together with the marinated Wild Blueberries. Serve soon after mixing in berries. Serves 6

Preparation time: Approx. 20 minutes, plus time for defrosting

Nutritional Information Per Serving:
111 calories; 5 g fat; 197 mg sodium; 17 g carbohydrates; 3 g fiber; 2 g protein

Chicken Saté with Wild Blueberry Peanut Butter Sauce



Wild Blueberry Sauce

- 3 tablespoons finely chopped or grated fresh ginger
- 1 shallot or ¼ cup onion
- 1 teaspoon oil
- 6 ounces water
- 3 tablespoons crunchy peanut butter
- 1½ cups frozen Wild Blueberries
- 1 teaspoon cornstarch
- ½ teaspoon salt

Satés

- 2 double chicken breasts (or 4 single) or 1 lb. pre-packaged thinly sliced chicken breast
- Salt and pepper
- 1 tablespoon of olive oil
- Skewers

PREPARATION

Peel the ginger and shallot, finely dice. Heat oil and briefly sauté both. Add the water and peanut butter over medium heat and whisk together. Add frozen Wild Blueberries. Mix small amount of water in cornstarch and add to berry/nut sauce. Bring to a boil and simmer for about 3 minutes. Season to taste with salt and pepper. Cut the chicken breast filets lengthwise into thin strips or use prepared sliced breasts. Flavor with salt, pepper. Put the strips in an accordion manner onto a lightly oiled skewer. Heat oil in a coated pan and cook the skewers from both sides for 2-3 minutes each. Serve together with the blueberry sauce. Serves 4

Preparation time: Approximately 30 minutes

Nutritional Information Per Serving:
306 calories; 14 g fat; 534 mg sodium; 12 g carbohydrates; 3 g fiber; 34 g protein

Healthy recipes and more at: **wildblueberries.com**

Wild Blueberry Smoothie

Ingredients

- 1 cup frozen Wild Blueberries
- 1 ripe banana, peeled and cut in pieces
- 1 cup vanilla yogurt
- 1 tablespoon honey (more if desired)
- ½ cup orange juice
- Mint leaves for garnish

PREPARATION

Place all ingredients in blender and mix until creamy. If too thick add small amounts of juice or milk until desired consistency. 3 (12 ounce) servings

Tip: Vary smoothie ingredients for added protein and vitamins. Try silken firm tofu, protein powder, a sprinkle of wheat germ or flax seed, or a variety of 100% fruit juices

Nutritional Information Per Serving:
162 calories; 1 g fat; 47 mg sodium; 36 g carbohydrates; 3 g fiber; 4 g protein

Healthy recipes and more at: **wildblueberries.com**

Cheesecake with Wild Blueberries

Crust Ingredients

- ⅓ cup toasted walnuts
- ⅓ cup sugar
- 1½ cups crushed graham crackers
- 6 tablespoons margarine or butter, melted

Filling Ingredients

- 3 packages (8 ounce) reduced-fat cream cheese (not fat-free)
- 1¼ cups sugar
- 1 teaspoon vanilla
- Zest and juice of one orange
- 1 package gelatin

Topping Ingredients

- ¼ cup sugar
- 1 tablespoon cornstarch
- Pinch of cinnamon
- 2 cups Wild Blueberries
- 2 teaspoons lemon juice

PREPARATION

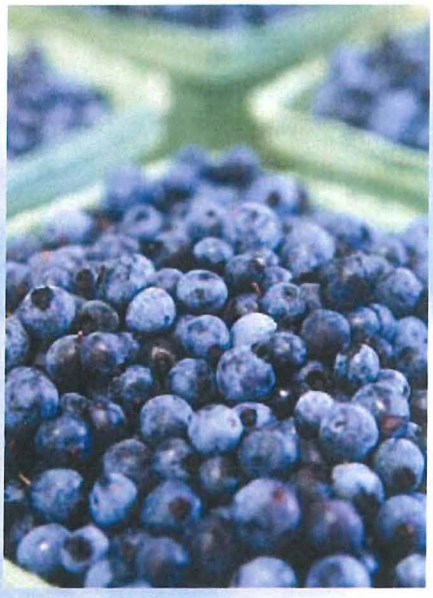
Finely chop walnuts. Mix with ⅓ cup of sugar, graham cracker crumbs and butter. Cover bottom of spring form pan with parchment paper. Press mixture into bottom of pan, refrigerate 1 hour. Mix cream cheese, 1¼ cups of sugar and vanilla. Add grated orange zest. Squeeze orange and add enough water to make ½ cup. Sprinkle gelatin over juice mixture in small pan. Let stand 1 minute. Stir on low heat until dissolved, 3 minutes. Cool slightly. Gently mix with cream cheese mixture.

In a 1-quart saucepan, combine ¼ cup of sugar, cornstarch and cinnamon. Add Wild Blueberries, sprinkle with lemon juice. Gently stir over medium heat until mixture comes to a boil. Stir 2 additional minutes. Remove from heat, cool. Spread over cheesecake. Refrigerate cheesecake for 2-3 hours. Serves 8

Nutritional Information Per Serving:
417 calories; 22 g fat; 387 mg sodium; 49 g carbohydrates; 2 g fiber; 8 g protein

Healthy recipes and more at: **wildblueberries.com**

Fresh Wild Blueberries From Maine



Once a year, Wild Blueberries arrive fresh from the fields and barrens of Downeast Maine. With their delicious, sweet-tart flavor and powerful antioxidant benefits, the little Wild Ones disappear quickly. Don't disappoint your customers! Order Fresh Wild Blueberries today.

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE™

- Available August thru mid-September
- Packed 12 pints per case

Nature's Antioxidant Superfruit

Wild Blueberries are the little ones with nature's Wild Advantage. Compared to larger cultivated blueberries, the Wild Ones have:

- Twice the antioxidant capacity*
- A sweeter, tangier flavor
- More berries per pint

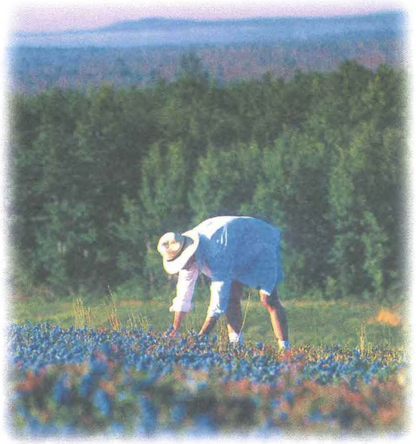
ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE ®

With Maine *Wild* Blueberries!

Recipes at WildBlueberries.com

*ORAC of Selected Foods; USDA-ARS, 2010

WILD BLUEBERRIES



Welcome to the Land of Wild Blueberries

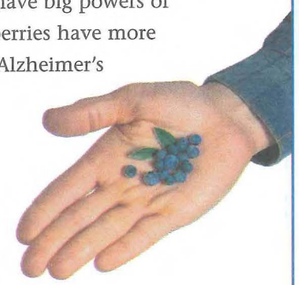
In the beautiful coastal fields and barrens of Downeast Maine and Canada, Wild Blueberries have grown naturally for thousands of years. These irresistibly delicious, good-for-you Wild Blueberries are a symbol of Maine's agricultural heritage—a heritage that values and respects our environment.Look for fresh Wild Blueberries during harvesttime, or frozen Wild Blueberries year-round in your grocer's freezer.

Wild Blueberries® Nature's Great Taste

www.wildblueberries.com

DISCOVER The POWER of Blue™

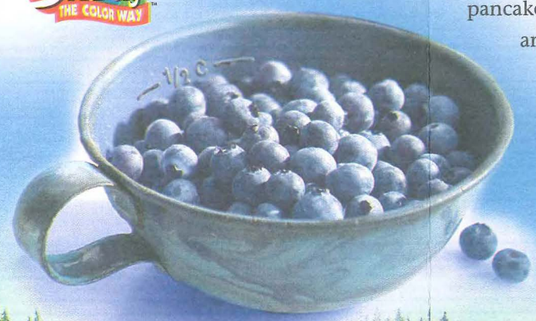
Wild Blueberries may be small, but studies show they may have big powers of protection. Rich in natural, "blue" antioxidants, Wild Blueberries have more of what your body may need to fight cancer, heart disease, Alzheimer's disease, urinary tract infections and the effects of aging.



GET YOUR DAILY DOSE OF BLUE™

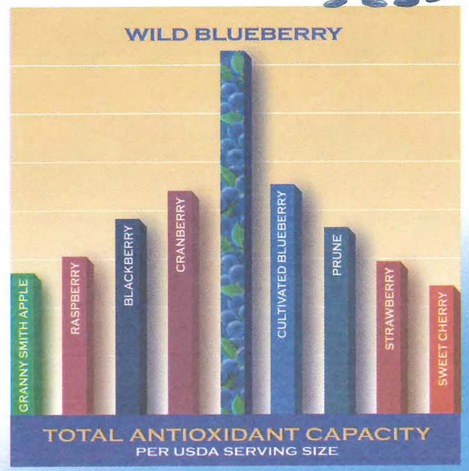
Just a half cup of Wild Blueberries satisfies one of your recommended 5 A Day servings of colorful fruits and vegetables. It's so easy to add Wild Blueberries, fresh or frozen, to cereal, yogurt, salads, pancakes, muffins, smoothies and more. It's a delicious way to get your Daily Dose of Blue.™

5 A Day THE COLOR WAY™



Nature's #1 Antioxidant Fruit™

Wild Blueberries are a tasty way to eat right! In USDA studies,* Wild Blueberries ranked #1 in antioxidant activity compared with more than 20 other fruits. This makes them powerful allies in the quest for good health.

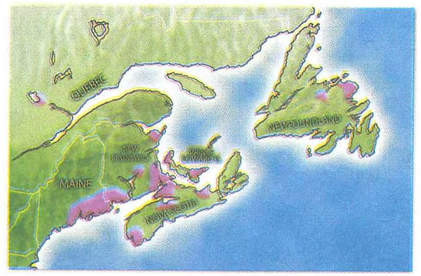


Wild Blueberries rank #1 in USDA studies measuring the antioxidant activity of more than 20 other fruits.*

* *Journal of Agricultural and Food Chemistry*, 2004, 52:4026-4037

WILD BLUEBERRIES

THE ANTIOXIDANT SUPERFRUIT™



Welcome to the Land of Wild Blueberries

In the beautiful coastal fields and barrens of Downeast Maine and Canada, Wild Blueberries have grown naturally for thousands of years. Irresistibly delicious, and so good for you, premium-quality Wild Blueberries are a symbol of our agricultural heritage—and a locally grown treasure.

Wild Blueberries are Naturally Nutrient Rich

Wild Blueberries are packed with natural, blue antioxidants that may help protect against **cancer, heart disease, Alzheimer's** and other age-related risks. In fact, a half-cup serving of Wild Blueberries has more antioxidant power than most other fruits—an excellent reason to eat Wild Blueberries every day!

Healthy Goodness... Fresh or Frozen

Look for Wild Blueberries fresh at harvest time, or fresh-frozen year-round in your supermarket. The FDA has concluded that frozen fruits and vegetables are just as healthy as fresh, making Frozen Wild Blueberries a smart choice all year long.

Wild Blueberries have the highest antioxidant capacity per serving, compared with more than 20 other fruits.*

Wild Blueberry Smoothie

Ingredients

- 1 cup frozen Wild Blueberries
- 1 ripe banana, peeled and cut in pieces
- 1 cup vanilla yogurt
- 1 tablespoon honey (more if desired)
- ½ cup orange juice
- Mint leaves for garnish

PREPARATION

Place all ingredients in blender and mix until creamy. If too thick add small amounts of juice or milk until desired consistency. 3 (12 ounce) servings.

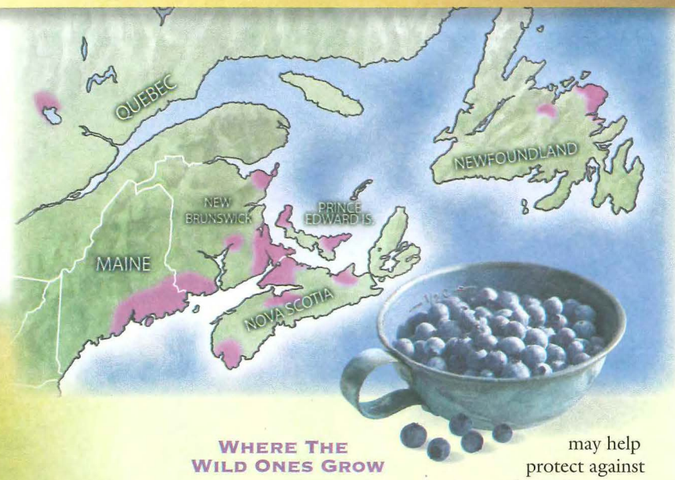
Wild Blueberries® Nature's Great Taste

wildblueberries.com

*Journal of Agricultural and Food Chemistry, 2004, 52:4026-4037

Welcome TO THE LAND OF *Wild Blueberries*

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE™
WWW.WILDBLUEBERRIES.COM



WHERE THE WILD ONES GROW

In the beautiful fields and barrens of Downeast Maine and Canada, Wild Blueberries have grown naturally for thousands of years. Sweet, tangy and so good for you, premium Wild Blueberries are a symbol of our agricultural heritage — and a locally grown treasure.

NOT JUST BLUEBERRIES, WILD BLUEBERRIES

By nature, Wild Blueberries have more of the healthy "blue" antioxidants that may help protect against cancer, heart disease, Alzheimer's and other age-related health risks. In fact, a half-cup of Wild Blueberries has more antioxidant power than most other fruits, including cultivated blueberries!

DAILY DOSE OF BLUE®

Look for Wild Blueberries fresh at harvest time or fresh-frozen year-round in your grocer's freezer. The FDA has concluded that frozen fruits and vegetables are just as healthy as fresh. So be sure to get your Daily Dose of Blue every day!

1 The Wild Blueberry is one of three berries native to North America. The other two are:
- *a. Strawberries*
- *b. Raspberries*
- *c. Cranberries*
- *d. Concord Grapes*
- *e. Elderberries*

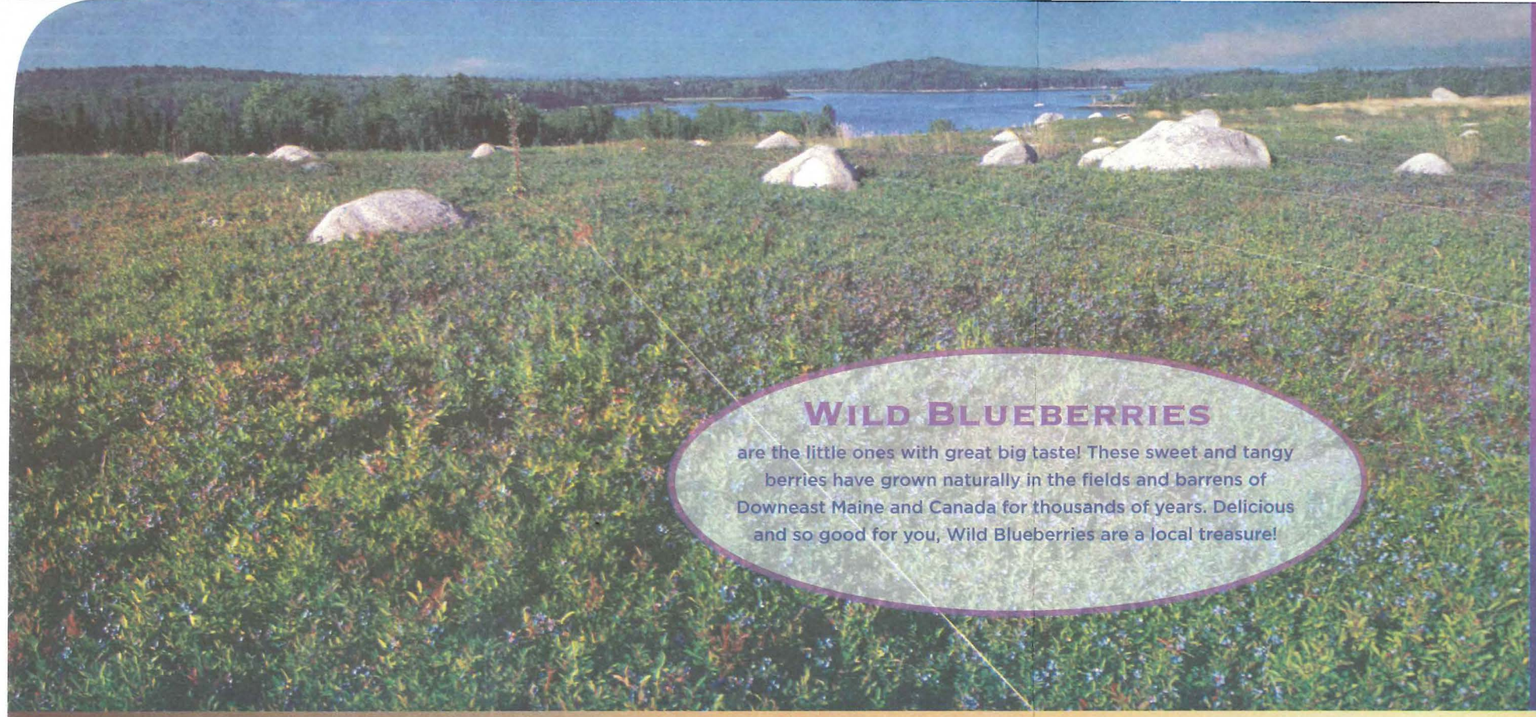
2 North America's earliest inhabitants prized Wild Blueberries for their flavor, nutrition and healing powers, using them for:
- *a. Tea*
- *b. Soup*
- *c. Medicine*
- *d. Preservatives*
- *e. All of the above*

3 17th-century New Englanders used Wild Blueberries in which of these traditional desserts:
- *a. Grunt*
- *b. Buckle*
- *c. Mush*
- *d. Slump*
- *e. Fool*
- *f. All of the above*

4 Each spring, these visitors arrive by the millions to help pollinate the Wild Blueberry crop:
- *a. Bears*
- *b. Birds*
- *c. Bees*
- *d. Butterflies*

5 True or False: Wild Blueberry fields are not planted. They spread primarily by underground runners, or rhizomes, which send up new roots and stems.

Answers: 1. c & d; 2. e; 3. f; 4. c; 5. True



Wild Blueberries

are the little ones with great big taste! These sweet and tangy berries have grown naturally in the fields and barrens of Downeast Maine and Canada for thousands of years. Delicious and so good for you, Wild Blueberries are a local treasure!

Test your *Wild Blue* I.Q.

1. The 5-point star on top of the Wild Blueberry is called a
   a. Stem
   b. Calyx
   c. Leaf
   d. Clone

2. Where do Wild Blueberries grow?
   a. On low bushes
   b. In barrens
   c. In fields
   d. All of the above

3. True or False: Wild Blueberries thrive naturally in the glacial soils and northern climates found in Maine and Canada.

4. Wild Blueberries are Nature's #1 SuperFruit because they have more:
   a. Vitamin C
   b. Protein
   c. Antioxidants
   d. Fiber

Welcome To the Land of *Wild* Blueberries

Not Just Blueberries, Wild Blueberries

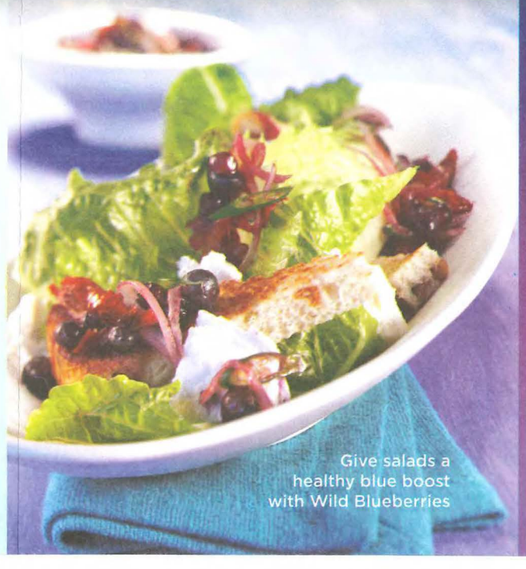
Wild Blueberries are packed with natural "blue" antioxidants that help your body stay healthy. Compared with most other fruits—including the larger cultivated blueberries—Wild Blueberries have more of the antioxidant power that may help protect against cancer, heart disease, Alzheimer's and other age-related diseases.

Where the Wild Ones grow

Get Your Daily Dose of Blue

Wild Blueberries are fresh-frozen at harvest so they taste great and retain their antioxidant goodness. In fact, studies show that Frozen Wild Blueberries are just as nutritious as fresh. And they're easy to use right out of the freezer—in smoothies, salads, pancakes, pies and more!

LOOK FOR
Wild Blueberries
ON YOUR RESTAURANT MENU!



Give salads a healthy blue boost with Wild Blueberries

5. Growers use strings to:
   a. Mark their fields for the pickers
   b. Guide landing planes
   c. Attract bees
   d. Keep away the bears

Answers: 1: b; 2: d; 3: T; 4: c; 5: a

ANTIOXIDANT RICH
WILD BLUEBERRIES
PREMIUM BY NATURE

For wonderful Wild Blueberry recipes, visit our website at wildblueberries.com

Maine's Native Berry

The Wild Blueberry holds a special place in Maine's agricultural history—one that goes back centuries to Maine's Native Americans. They were first to use the tiny berries, both fresh and dried, for their flavor, nutrition and healing qualities.

In late summer, the beautiful Wild Blueberry fields and barrens are harvested, often in the traditional way using hand-held berry rakes.

Wild Blueberries were harvested commercially as early as the 1840s. Today, with a market value of more than $190 million annually, Wild Blueberries make a major contribution to Maine's economy.

Demand for both fresh and frozen Wild Blueberries is steadily growing in the US and abroad, thanks to research on the health and nutritional benefits of these antioxidant-rich berries. The future looks bright for Wild Blueberries—Maine's Official State Berry. For more on the health story visit wildblueberries.com.

Preserving Maine's Wild Blueberry Heritage

Wild Blueberries have become a symbol of Maine's agricultural heritage—a heritage that respects and values our environment. Because growers are committed to being good stewards of the land, future generations will continue to enjoy some of Maine's most scenic vistas and precious wildlife habitats.

To learn more about Maine's Wild Blueberries and the lands on which they grow, talk with a local Wild Blueberry grower or contact the Wild Blueberry Commission of Maine.

WILD BLUEBERRY COMMISSION *of* MAINE

5784 York Complex, Suite 52, Orono, Maine 04469
207-581-1475

Maine's WILD BLUEBERRY LANDS

Preserving our agricultural heritage for future generations

The Wild Blueberry

Maine's 60,000 acres of Wild Blueberries grow naturally in fields and barrens that stretch from Downeast to the state's southwest corner. Naturally suited to Maine's acidic, low-fertility soils and challenging winters, Wild Blueberries are a low-input crop requiring minimal management. The berries are grown on a two-year cycle. Each year, half of a grower's land is managed to encourage vegetative growth and the other half is prepared for the Wild Blueberry harvest in August. After harvest, the plants are pruned to the ground by mowing or burning.

Integrated Crop Management

Wild Blueberries are indigenous to Maine and, therefore, are naturally resistant to many native pests. Still, there are times when environmental stressors such as disease, drought, insect pest damage and winter injury can ruin much of the fruit.

To minimize crop damage without harming the environment, growers use continually evolving knowledge-based techniques called Integrated Crop Management (ICM) and Integrated Pest Management (IPM). For example, taking leaf

Wild Blueberry growers use a variety of pest scouting techniques including sweeping to actively monitor insect levels.

tissue samples to determine whether plants need to be fertilized is now a common ICM practice. Growers use ICM and IPM throughout the crop cycle to monitor for disease and insect levels that could reduce crop quality and quantity. When necessary, growers consider a full range of control methods, from cultural techniques to the selective application of pesticides.

Learning Through Research

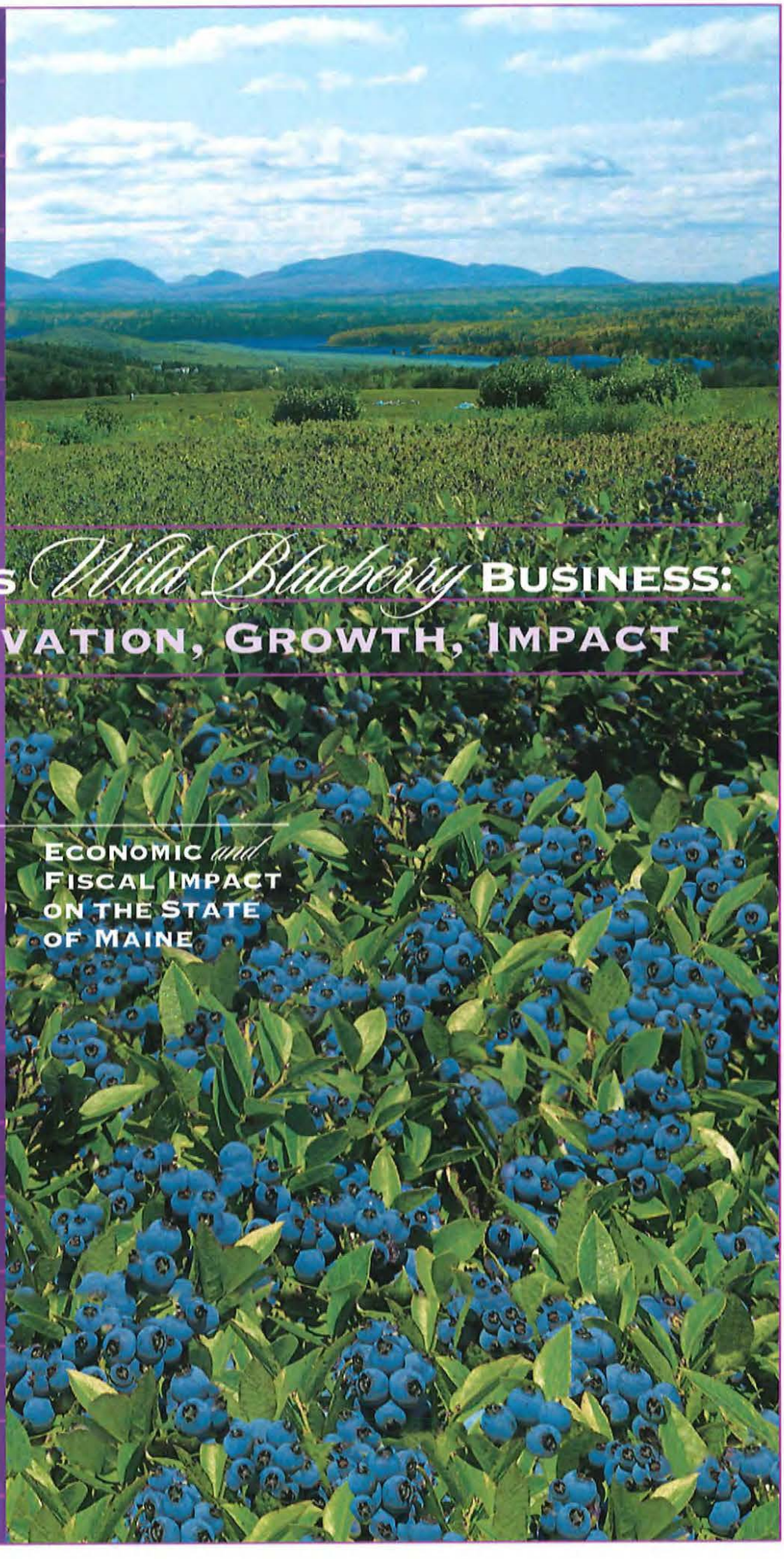
Since 1945, Maine's Wild Blueberry growers and processors have provided financial support for research at the University of Maine. This successful partnership has resulted in improved cropping practices such as ICM and IPM.

A new laboratory facility at Blueberry Hill Farm in Jonesboro was dedicated in 2006 for advanced crop management research.

Since 1980, insecticide use has declined by 80% thanks to an IPM effort to monitor and control blueberry fruit fly, the crop's number-one pest. There are now years when growers do not have to treat their fields at all.

Research is the foundation upon which Maine's growers have tripled the state's production of Wild Blueberries. Thanks to advances in ICM and IMP, growers are better able to minimize crop loss while sustaining Maine's Wild Blueberry fields and barrens for future generations.

Within hours of being harvested, Wild Blueberries are cleaned and individually quick frozen, using state-of-the-art technology.



Maine's *Wild Blueberry* Business: Innovation, Growth, Impact

Economic *and* Fiscal Impact on the State of Maine

Annual Economic Impact *of the* Wild Blueberry Business *in* Maine

Maine is the largest producer of Wild Blueberries in the world. The economic impact of this agricultural business is vital to our state, as shown by a recent report based on 2007 crop figures. In summary, every year the Wild Blueberry business makes a significant contribution to Maine's economic well-being:

- **$173 million** in direct sales impact
- Over **$250 million** in total economic impact
- Approximately **2,540 Maine jobs** – many in Maine's most economically challenged areas
- Approximately **$63 million** in personal income
- Nearly **$9 million** in state and local tax revenues
- Potential for a **$400-$500 million** annual impact over the next decade

Innovation and Investment

Over the last 30 years, investments in research and development, centered at the University of Maine, have fueled growth and innovation within the Wild Blueberry industry and transformed it into a modern, state-of-the-art food producer.

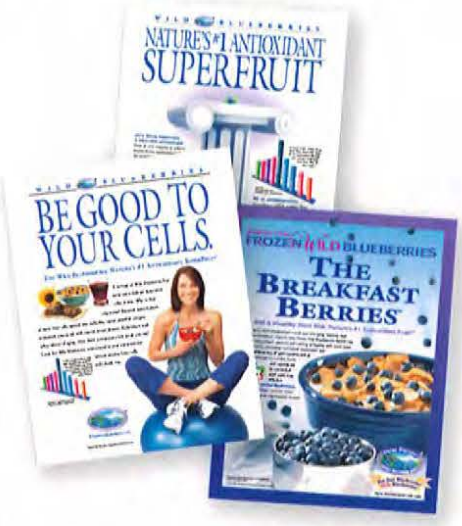
- **Integrated Crop Management (ICM)** Today's growers use a sophisticated knowledge-based cropping system.

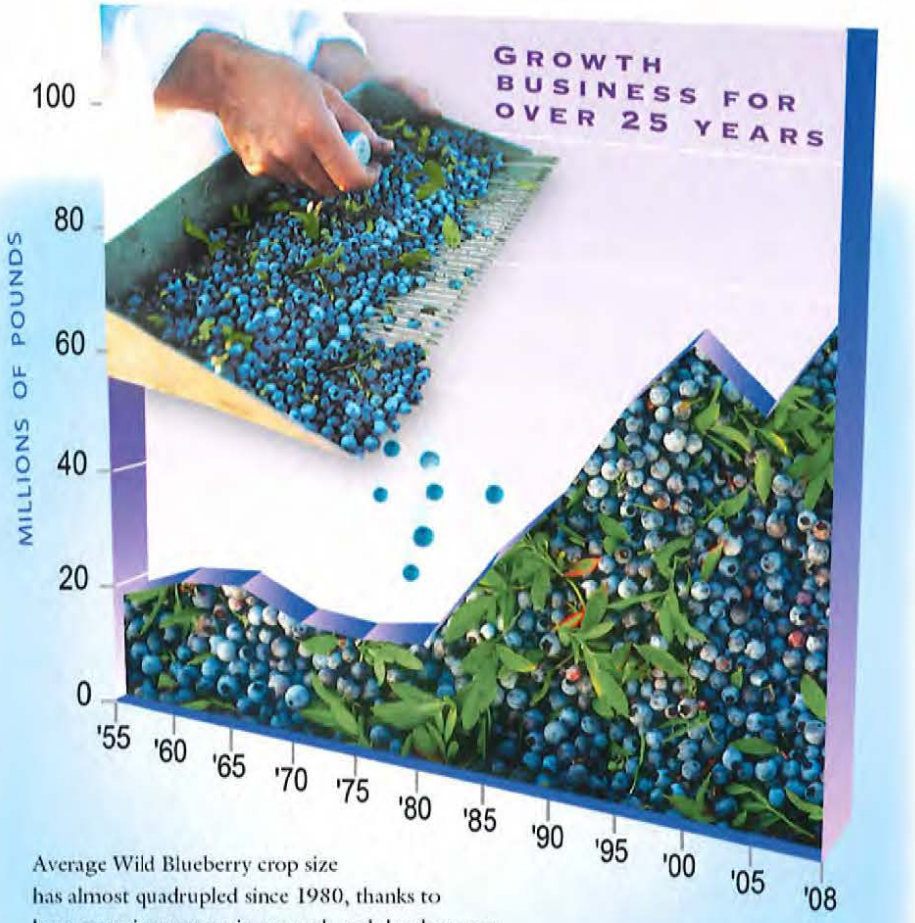
- **Advanced Technology** Processors use laser color sorters and other high-tech equipment to meet worldwide demand for premium-quality frozen Wild Blueberries.

- **$16 Million in Capital Investment** Annual industry investments such as land improvements and new equipment add to Maine's direct sales economic impact.

An Economic Engine for the Future

The economic impact of the Wild Blueberry industry benefits Maine as a whole and in particular some of the most economically challenged areas of our state including Downeast Maine where farming and food processing provide jobs and business diversification. As demand continues to grow, this impact has the potential to nearly double over the next decade.



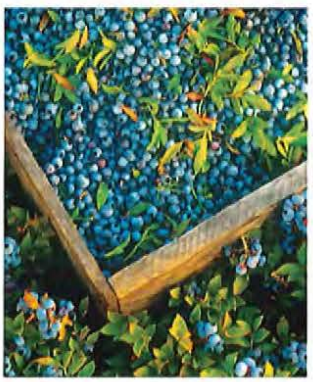


Average Wild Blueberry crop size has almost quadrupled since 1980, thanks to long-term investment in research and development and reinvestment by Maine's growers and processors.

- **Marketing and Promotion**
  Funded by growers and processors, marketing and PR efforts have elevated consumer awareness of the health benefits of Wild Blueberries, driving ever-greater demand for this "antioxidant superfruit." See www.wildblueberries.com.
- **Sales Growth**
  Sales of Wild Blueberries and Wild Blueberry products have increased consistently over the last decade and are projected to continue increasing well into the future.
- **$400- to $500-Million Potential**
  With continued improvements in field productivity and processing facilities, and continued local, state and federal support, the annual economic impact is expected to increase twofold over the next decade.

Heritage of Innovation

Wild Blueberries have been part of Maine's agricultural heritage for centuries. Prized by Maine's native inhabitants for their nutritious and healing properties, Wild Blueberries were first harvested commercially in the 1840s. Today, Wild Blueberries are in high demand worldwide, considered an anti-aging superfood and a premium fruit ingredient. With further innovation, investment and policy support, this business will maintain its commitment to Maine's outdoor heritage and increase its contribution to Maine people and the economy.



MAINE'S *Wild Blueberry* BUSINESS: INNOVATION, GROWTH, IMPACT

- Maine's Wild Blueberries have been commercially harvested since the 1840s.
- Wild Blueberry processing innovations began with canning in the 1860s, development of the Individually Quick Frozen (IQF) berries in the 1960s, and now include computer color-sorting technology.
- In the late 1990s Maine's Wild Blueberry growers and processors recognized that demand would increase by communicating the health research message to consumers for "Nature's Antioxidant SuperFruit."
- Thanks to comprehensive crop production research and development based at the University of Maine, Maine's Wild Blueberry growers are leaders in the development and adaptation of knowledge-based cropping systems.
- Maine has quadrupled its annual crop yield from 20-million pounds in the 1980s to between 70-million and 100-million pounds today, making Maine the largest producer of Wild Blueberries in the world.
- In 2007, direct and indirect economic impact of the Wild Blueberry business in Maine totaled $250 million.
- Public policy support for farmers and food processors in Maine is a key to reaching future economic potential of up to $500 million in annual economic impact over the next decade.

THIS REPORT IS A SUMMARY OF

THE ECONOMIC & FISCAL IMPACT ON THE STATE OF MAINE OF THE WILD BLUEBERRY INDUSTRY,

FEBRUARY 2009

PREPARED BY PLANNING DECISIONS, INC.

WILD BLUEBERRY COMMISSION *of* MAINE

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Maine Wild Blueberries

America's Native Berry

THE WILD BLUEBERRY CLASSROOM CURRICULUM

Wild Blueberry Table of Contents

ACKNOWLEDGEMENTS

This lesson kit was made possible with the generous support of Maine's Wild Blueberry growers and processors through the efforts of the Wild Blueberry Commission of Maine. We would like to acknowledge the efforts of the professional curriculum developers, graphic artists, technical reviewers, and educators who piloted the lessons in their classrooms and all others who assisted in the development of these lessons. We also want to thank in advance educators who plan to incorporate elements of this kit into their classrooms. It is our sincere hope that these lessons will benefit students in Maine and beyond by helping them develop an understanding of the linkage between people and our environment in which we live.

— *Wild Blueberry Commission of Maine*

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Wild Blueberry Poetry

Blueberry barrens

Brief Description

The students will explore poetry and art using the wild blueberry as the object of their efforts. They will write and illustrate a poem using descriptive language and read their poems to the class.

Correlations to State of Maine Learning Results: Parameters for Essential Instruction

Content Area	Performance Indicator	Grades 3-5 Descriptor(s)	Grades 6-8 Descriptor(s)
English Language Arts	A2 B1	f, g f	f c
Science and Technology	A1 E2	a c, d, e	a b
Social Studies	D2	b	b
Visual and Performing Arts	B1		

Objectives:

The students will:

1. write a poem about wild blueberries using one or more forms of poetry.
2. edit and compile the poems into a book or newspaper.
3. illustrate their poetry (and/or book) using an art technique or medium of their choice.

Life Skills:

Describing, developing appreciation, developing vocabulary, editing, expressing one's self, illustration (or other art forms), observing, writing

Materials:

- Writing materials and paper
- Art supplies
- Computer and CDs

Estimated Teaching Time:

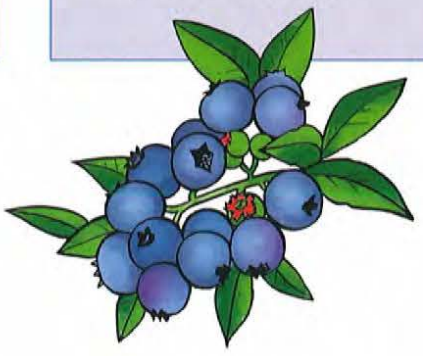
Two or three 45-minute class periods

Preparation:

Insure that the poster accompanying this educator kit is displayed where students can see it.

Vocabulary:

Cinquain, Haiku, Acrostic (Other vocabulary words will develop as the students write.)



BACKGROUND

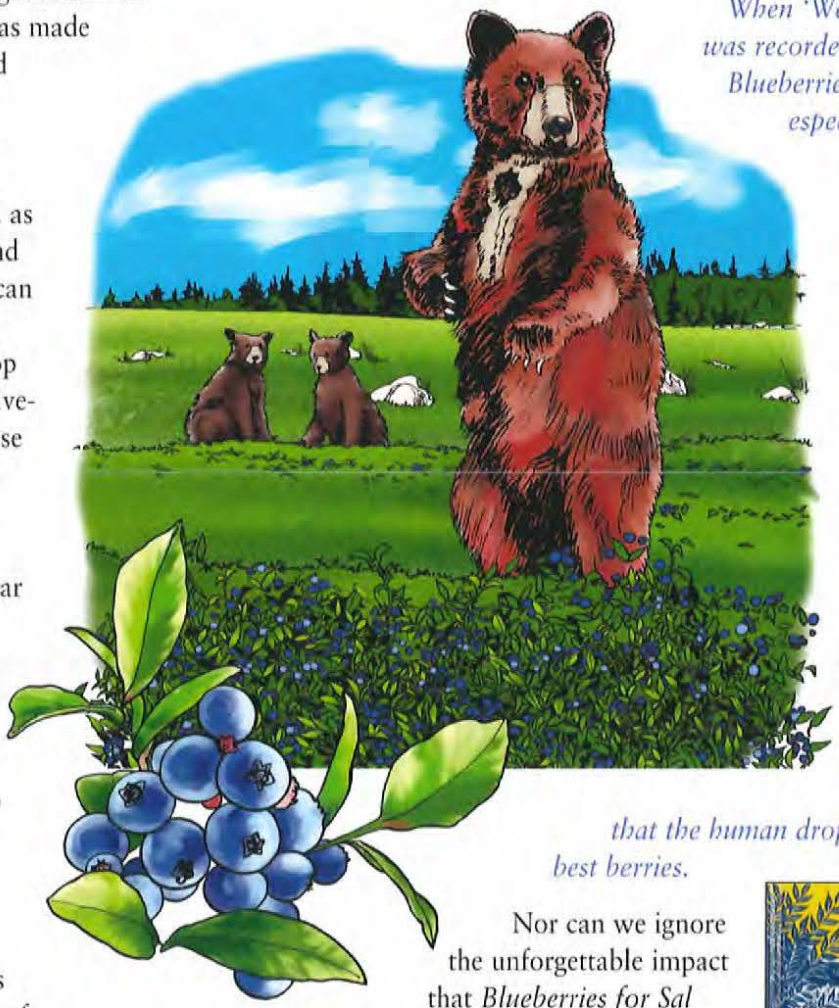
The wild blueberry has been part of Maine's history, culture and economy for centuries. The wild blueberry was an essential part of the Native American diet and culture long before settlers came to Maine. It was eaten fresh in the summer, dried for use in the winter as a seasoning for stews and soups, and used for curing meats. The crushed wild blueberry was made into dyes. It was also used in medicine. Brewed as a pungent tea, it was given to relieve pain. Blueberry juice and syrup were used as cough medicine. It was and is a part of Native American legends and is believed to have magical powers. Atop each wild blueberry is a five-pointed star that is the base of its earlier flower calyx. Legend has it that during a time of starvation, the Great Spirit sent these "star berries" down from the heavens to relieve the hunger of his children.

When settlers arrived, the Native Americans showed them the wild blueberry barrens that had been cared for by burning on a regular basis and taught the many uses of the wild blueberry. Colonists in 17th century New England created foods called Grunt, Slump, Mush, Buckle, and Fool made from wild blueberries. During wild blueberry season, one of these dishes usually graced the supper table.

The importance of the wild blueberry to Maine's economy is still in effect today. It affects not only the economy, but also our culture and diet. One such example can be found in Robert Frost's poem, "Blueberries," published in 1914 by Holt and Company in North Boston. It begins like this:

You ought to have seen what I saw on my way
To the village, through Patterson's pasture today:
Blueberries as big as the end of your thumb,
Real sky-blue, and heavy, and ready to drum
In the cavernous pail of the first one to come!...

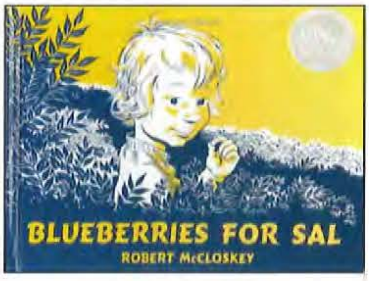
Or in Pauline W. Moore's *Blueberries and Pulsey Weed: The Story of Lovell, Maine*:



When 'Went A-Blueberrying' was recorded it was really summer. Blueberries were plentiful, especially where the land had been burned over...

If it had been an extremely dry summer, the berry pickers had to watch out for bears that stood up on their hind legs and reached for the big ones just as the humans did. Many bears have been seen by blueberry pickers but never has anyone been hurt. Both the bears and humans run as fast as possible, the only difference being that the human drops a basket full of his best berries.

Nor can we ignore the unforgettable impact that *Blueberries for Sal* has had on young children across the United States. In the classic story, a young girl in Maine wanders away from her mother while blueberry picking to come face-to-face with a mother black bear whose cub has also wandered away to come face-to-face with Sal's mother.



Poetry is also a part of our culture. It has allowed us to paint word pictures to express thoughts and feelings about our experiences. There are many forms of poetry. Three of these are Haiku, Cinquain, and Acrostic.

HAIKU

Haiku is a Japanese poetry form that always has three lines that do not rhyme. The first line always has five syllables. The second line always has seven syllables. And the third line always has five syllables. It is usually written about nature or the seasons.

Example:

Line 1, 5 syllables – Blueberry picker
Line 2, 7 syllables – raking blueberry barrens
Line 3, 5 syllables – summertime in Maine

CINQUAIN

The Cinquain is a five-line poem that is based on the number of words or syllables. Each line has a theme and a given number of words or syllables.

Line one: a title written in two words or syllables
Line two: a description of the title in four words or syllables
Line three: a description of action in six words or syllables
Line four: a description of a feeling in eight words or syllables
Line five: another word for the title in two words or syllables

Example:

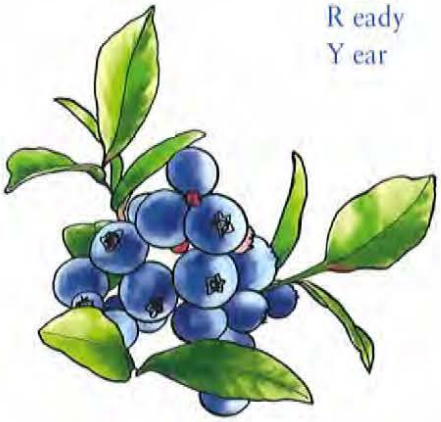
Wild Blueberry.
Sky-blue, round, sweet.
Raking on the barrens.
Sweet happiness in round, blue balls.
Wild joy!

ACROSTIC

Acrostic poetry uses a word written down the left side of the page. Using the letter of the word as the first letter of another word or phrase a poem is written.

W onderful
I nspired
L ovely
D elights

B lue
L ights
U plifting
E very
B erry
E very
R ipe
R eady
Y ear



ACTIVITY

1. Display both the poster and the folder that contains this kit. Ask students to brainstorm and write a list of words that describe these images. Use both the inside and outside of the folder.

2. Select one or more of the poetry types for the students to utilize and have each write their own poem using words that have been developed in the brainstorming session.

3. Have the students edit their poems and reproduce a final copy onto a large sheet of construction paper. Have the students select a medium and illustrate their poems.

4. Have the students read and display their poems, then post their works or have the class compile them into a book.

EXTENSIONS

1. In conjunction with the other lessons in this educator kit, have the students each compile their own wild blueberry book that contains poetry, artwork, an advertisement, the life cycle description and sequence, etc.

2. Create a wild blueberry newspaper and have the students compile efforts from these lessons into sections of the newspaper.

3. Have the students research other instances where wild blueberries are used in literature, poetry, the press, etc.

4. Have older students write longer poems and turn them into song lyrics, create a rap song or write a free verse.

EVALUATION

1. Evaluate the poetry and accompanying artwork as they relate to the style chosen.

2. As an evaluation tool, assign the students to develop a greeting card that contains a poem and is illustrated. Include these in a portfolio.

RESOURCES

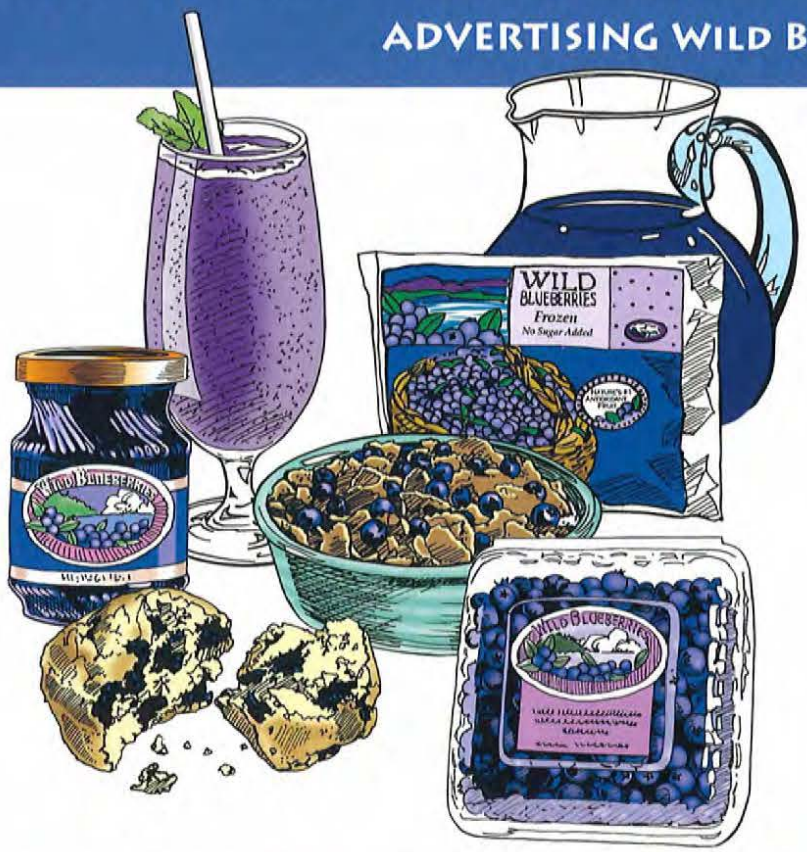
1. McCloskey, Robert. *Blueberries for Sal.* New York: Penguin Putnam Books for Young Readers, 1976.

2. Lathem, Edward Connery ed., *The Poetry of Robert Frost.* New York: Holt, Rinehart and Winston, 1964.

3. Moore, Pauline Winchell. *Blueberries and Pusley Weed: The Story of Lovell, Maine.* Kennebunk, Maine: Star Press, Inc., 1972.

NOTES:

ADVERTISING WILD BLUEBERRIES



BRIEF DESCRIPTION

Students will explore the role of advertising in influencing consumer choices. Students will then utilize methods employing language and visual arts to develop their own advertisements and/or commercials to promote the sale of Maine's wild blueberries.

CORRELATIONS TO STATE OF MAINE LEARNING RESULTS: PARAMETERS FOR ESSENTIAL INSTRUCTION

Content Area	Performance Indicator	Grades 3-5 Descriptor(s)	Grades 6-8 Descriptor(s)
English Language Arts	F1	a, b	b, c
Health Education and Physical Education	D1 E2	c b	c b
Science and Technology	B1	d	
Social Studies	A1 A3	e, g	f
Visual and Performing Arts	B3		a, c

OBJECTIVES:

The students will:

1. identify advertisements and commercials that are used to market food products.
2. review those advertisements and commercials to identify the components that influence consumer choices.
3. develop their own advertisements and/or commercials to market Maine's wild blueberries.
4. describe the influence of advertising on their own food choices.

LIFE SKILLS:

Critical thinking, decision-making, vocabulary development, assessment, persuasion

MATERIALS:

- Advertisements from newspapers and magazines
- A selection of publications aimed at the students' demographic group
- A selection of videotaped commercials
- Paper and art supplies
- Camcorder and videotapes
- Computer and CDs

ESTIMATED TEACHING TIME:

Teacher preparation time, one week in advance of teaching the lesson; two 45-minute to one-hour class periods plus time for student research and creativity

PREPARATION:

- If needed, send letters home to parents alerting them to the homework assignment that involves tallying television commercials (see example).
- Videotape or download from the internet and burn onto a disk a series of commercials that influence consumer choices when buying food.
- Save, or have the students save, advertisements from newspapers and magazines.
- Examine publications aimed at the age group of the class and select several ads that target this age group specifically, that may be different from adult ads.
- Decide if this lesson should be conducted in conjunction with the activity in the Health and Nutrition lesson that instructs students to create a new wild blueberry product.

VOCABULARY:

Advertisements, commercials, persuade, influence, target group

BACKGROUND

As current and future consumers, students should be aware of the influences that affect their desire to purchase products, consume certain foods, or wear a type of clothing. Students may one day grow up to operate businesses that need to market products and services or be employed by businesses that promote the sale of goods and services.

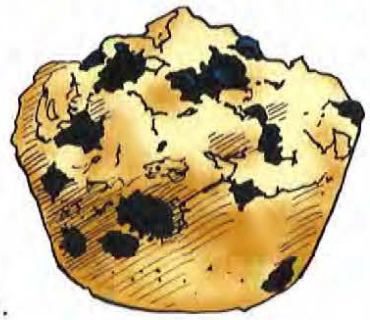
Once products are produced, businesses must convince consumers to purchase those goods or services. One way to interest consumers in a product is to advertise it. Millions of dollars are spent annually to convince consumers to purchase products. The techniques used have become very sophisticated since the early days of advertising. Music, art, language, and economics all play a role in efforts to convince consumers to shop at a certain store, purchase a certain product, or eat at a certain restaurant. Efforts underway to educate students to make healthy choices may be affected by the barrage of advertising they receive. This lesson will encourage students to examine the ways in which they are influenced to make these decisions, how to distinguish fact from opinion, how advertising affects their eating habits, and the role that music and graphic arts play in influencing their decisions.

INTRODUCTION

1. Ask students what influence they believe advertising has upon them. Let them discuss their opinions. Have they ever bought a product just because of an ad, commercial, or contest? Explain that this lesson will show them how advertising affects consumers' decision-making and give them an opportunity to employ techniques that they identify.

2. Have the students watch commercials on television for one week and complete the *Food Advertising Tally Sheet.* (Use the letter to parents, if needed, by copying it onto school letterhead or create your own version. This may also be structured as a family activity by sending home several copies of the tally and asking the parents to complete the tally as well as their child and discuss the differences as a family. It can be educational to learn the differences in types of products advertised at the various viewing periods – daytime, prime time, Saturday morning, sporting events, etc.)

3. While the students complete their tallies, have them bring to class advertisements from printed media such as newspapers and magazines. Ask them to specifically select food ads.



4. Print off some advertisements from the Internet that include contests that offer prizes while connecting the viewer to another site that is a commercial site. Or have students access such sites in class and identify the techniques that are being used to interest them in the products being promoted.

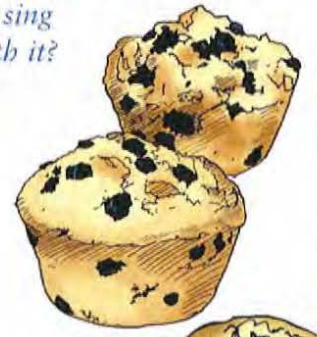
5. Videotape or download from the internet and burn onto a disk a series of commercials that influence consumer choices when buying food. Make sure that there are some that influence the consumer with music (a snappy song that repeats in one's head), visual appeal that makes the consumer crave a food (cake with gooey frosting), contests, name brand recognition, humor, promise of success, and a commercial that convinces a consumer to buy products on sale.

ACTIVITY ONE

1. As the students complete their tally, ask them to identify a food commercial that they like or feel is very effective: one that makes them want to buy the product.

2. Ask them to watch that commercial carefully and list the things about it that make it effective. Ask the students:

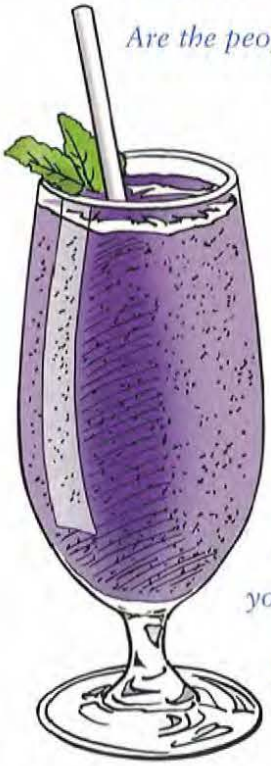
Does it have a song or jingle? What is it? Can you sing along with it?



Does it show the food? What makes you like it? Do you want to eat the food? Why?

Does it show people eating? Are they enjoying what they are eating? How can you tell? What do the people look like? Are they your age? Are they mixed ages? Does everyone look healthy?

Are the people having fun?



What colors are used? Do you like those colors?

What language is used? Are there any words that stand out? Do the words paint images in your head?

How does the commercial make you feel? Does it remind you of anything?

What will be the effect on you if you buy this product?

3. Once the students complete their tallies, use visuals to depict the results. The class may either:

a. create a huge classroom tally,
b. graph the results by category, or
c. divide the foods into healthy choices or unhealthy choices and make a graph of the results. Discuss the students' findings and the factors that influence them to buy products.

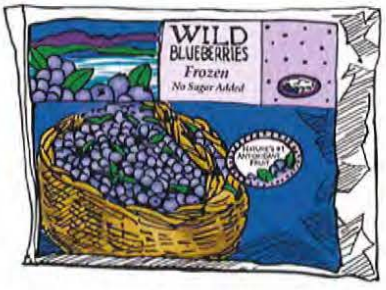
4. Show the video clips of commercials that you feel are very effective in the categories indicated and discuss what makes each commercial effective.

5. Compare the advertisement tallies with the recommendations of the MyPyramid (See p. 41). Ask if these are in alignment. Discuss the impact that advertising has on the students' personal food choices.

6. Now have the students examine print and Internet ads. Have them identify the factors that influence their decision-making. How is language used? How are art and visual images used? What is fact? What words influence them? Ask the questions that pertain from #2 above.

ACTIVITY TWO

1. Decide if the students will create a print ad, commercial or both. If commercials are to be produced, it is recommended that a small group be used to develop each commercial. Each student or group needs to decide what food the ads will promote that contains Maine wild blueberries (muffins, pies, ice cream, jam, etc.) or create their own unique food that contains Maine wild blueberries.



2. Instruct the students that they will now create their own advertisements (or commercials) to promote a very healthy food–Maine wild blueberries. If they are making a print ad, they will need a slogan and visual theme. If a videotaped commercial is to be produced, they should first create a script with directions or a storyboard that outlines how the taping will be done.

3. Work with the school cafeteria to display the ads during a time that Maine wild blueberries will be served and run the commercials on a TV.

EXTENSIONS

1. Create a large MyPyramid (a copy is included in the Health & Nutrition Wild Blueberry Style lesson on page 41) and tape the food ads to the appropriate category to determine whether the students are being encouraged to maintain a healthy diet. Discuss the results.

2. Examine the ads in a variety of publications targeted to different age ranges and interest areas to observe how advertising differs by population groups. Discuss the observations.

3. If the school cafeteria will work cooperatively with you on this project and plan to use Maine wild blueberries in their menu, have students create "radio spots" to promote these foods when they are being sold in the cafeteria. Ask that these radio spots be included in the morning announcements over the public address system. Or, if the school is so equipped, use the videotaped commercials on closed circuit television in the school.

EVALUATION

1. Assess the thoroughness of completing the *Food Advertising Tally Sheet.*

2. Evaluate the finished advertisements or commercials.

NOTES:

NAME_____

FOOD ADVERTISING TALLY SHEET

Watch commercials on television for one week. Count each time a food commercial appears and add it to the tally for the category listed below.

For the Week of:	Total
Vegetables	
Fruits	
Snack Foods	
Candy	
Dessert Foods	
Meats	
Eggs	
Soft Drinks	
Fruit Juices	
Breads and Crackers	
Cereals	
Milk	
Dairy Products	
Other	

Date _____

Dear Parent or Guardian:

During the next week, our class will be conducting a survey of television commercials to identify the methods used to influence consumers. The purpose of this lesson is to begin to develop decision-making skills as consumers by educating ourselves about the influences that surround us. It is our intent for the students to realize how audiences are targeted, the type of products advertised, and the techniques that are used to encourage purchasing. After the tally is complete and we compile the results, we will discuss the food advertising, food choices students make and address making healthy food choices.

You may wish to make this a family activity by keeping your own tally, comparing products promoted during each viewing period and having a family discussion. There are significant differences between the products promoted during daytime, prime time, sporting events and Saturday morning cartoon viewing.

We are not asking students to increase their television watching but to keep a tally of commercials during their regular viewing time. If you would like your child to be exempted from this television tally, please indicate your wishes below and have your child return it by the end of the week.

Thank you for your assistance with this activity. We hope it helps your child to become a more informed consumer.

Sincerely,

Producing Wild Blueberries

Bees are brought in to pollinate wild blueberry plants in bloom.

Brief Description

Students will explore the production of wild blueberries as it relates to their yearly life cycle, technology, and the food system. Students will then utilize methods employing language and visual arts to develop written and oral accounts of the production of Maine's wild blueberries.

Correlations to State of Maine Learning Results: Parameters for Essential Instruction

Content Area	Performance Indicator	Grades 3-5 Descriptor(s)	Grades 6-8 Descriptor(s)
English Language Arts	B1 B3 E1 E2	d a, b a, b a, b, c	e a, b a, b, c a, b
Science and Technology	A1 A3 C3 E2	a, b a b a, c, e	a, b, c a a, b
Social Studies	C2 E2	b b	b

OBJECTIVES: The students will:

1. listen to an oral account or read about the yearly production of Maine's wild blueberries in *Producing Wild Blueberries – A Two Year Cycle* and sequence artwork to coincide with that life cycle/production cycle.
2. develop captions for the artwork using correct terminology.
3. write, in their own words, a description of the annual cycles to produce wild blueberries in Maine and the process that brings those wild blueberries to the consumer.
4. prepare a poster (using a variety of resources) and oral presentation of the wild blueberry production process.

LIFE SKILLS: Sequencing, developing vocabulary, understanding systems, understanding seasons, writing to explain or describe

MATERIALS:

- Copies of the wild blueberry artwork
- Poster board
- Art supplies including scissors and paste
- Pens/pencils and paper

ESTIMATED TEACHING TIME:

Two or three 45-minute to one-hour class periods

PREPARATION:

- Gather the necessary art supplies and poster board
- Make copies of the artwork

VOCABULARY: Acidic, clone, cross-pollination, highbush blueberries, Integrated Crop Management (ICM), Integrated Pest Management (IPM), irrigation, lowbush blueberries, pH, pruning, rakers, rhizome

Background

The wild blueberry is one of only four commercially grown fruits that are native to North America. (Cranberries, concord grapes, and blackberries are the others.) The Native Americans were encouraging wild blueberry growth long before settlers came to Maine. Maine is the number one producer of wild blueberries in the world. Maine produces 13 percent of all blueberries in North America and accounts for almost all wild blueberries commercially produced in the United States. Wild blueberries grow on 60,000 acres in Maine.

Wild Blueberry Classification and Descriptions

Wild blueberry fields have been developed from native plants that grow naturally on the forest floor. All blueberries and cranberries are members of the Heath family, Ericaeceae. Both blueberries and cranberries are in the genus *Vaccinium*. Maine has several species of wild blueberries. The species most common is *angustifolium*. Most of Maine's wild blueberries fall into the botanical classification of *Vaccinium angustifolium*. This species has smooth stems that can be colored tan to red; dark green, smooth leaves; white or pinkish-white, bell-shaped blossoms; and grows four to 15 inches high. Its fruit is usually dark blue, but the waxy coating on the fruit makes it appear powder blue. A variety of *angustifolium, nigrum,* has the same traits except for the fruit. There is no waxy coating on the fruit, the fruit is black in color, and it tends to be larger and sweeter than its more common cousin. Both of these are sweet varieties.

A less sweet type, *Vaccinium myrtilloides,* is commonly known as the sour top blueberry. Common in hilly or mountainous areas, its stems are more branched and covered with tiny hairs. It also grows taller, six to 24 inches high. There are other differences as well. The leaves are light green, hairy on the underside, and curl downward. Its blossoms are also bell-shaped but are greenish white or sometimes tinged with red. The berries are smaller and less sweet than the other species'. All of these species are known as lowbush blueberries.

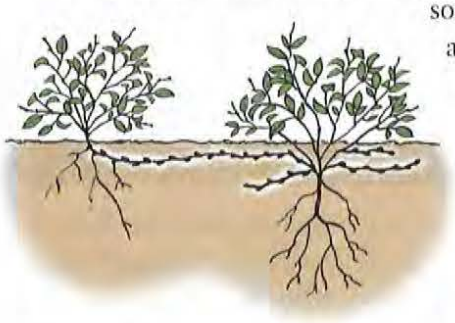
The last species, *Vaccinium corymbosum,* is known as a highbush blueberry. This species is more commonly found along lakes or ponds, but is sometimes found near managed wild blueberry fields.

Life Cycle Synopsis

The life cycle of the blueberry begins when the plants grow stems and leaves from underground rhizomes. In the summer and early fall, the plants set flower buds on the stems for the next year. Later in the fall the plants lose their leaves and go dormant for the winter. In the spring, growth resumes with new leaves and flowers. Once the flowers are pollinated by insects, they set fruit, the fruit grows and ripens, and the fruit is harvested. The plants are then pruned later in the fall or early next spring to begin the first-year cycle over again.

Starting a Wild Blueberry Field

Initially, many wild blueberry plants start naturally from seed. Once these plants are established, they send out underground stems known as rhizomes (horizontally spreading stems). Rhizomes grow near the surface of the soil and send up new stems above the soil that begin a new plant. The rhizome also develops roots so the plant or clone can increase in size. These new stems are known as a clone because they are genetically identical to the parent plant from which the rhizomes grew. A neighboring plant and its rhizomes are genetically different. One clone can cover from 75 to 250 square feet. An acre of wild blueberries (the size of a football field) may have 200 to 500 different clones.



While it is possible to develop new plants from seeds, rhizome cuttings, stem cuttings, sod cuttings and tissue culture, plants in commercial wild blueberry fields have been established naturally without human intervention.

The Cropping Cycle

While wild blueberries will grow and fruit without human help, fields of wild blueberries are managed to increase production. At least one of these techniques was developed by Native Americans. Most wild blueberry fields are pruned to the ground every other year by burning or mowing. Burning (first practiced by Native Americans) reduces certain insects and diseases but also burns organic matter in and on top of the soil. Mowing maintains the organic matter, but if the weather conditions are favorable, pest outbreaks may occur.

PLANT GROWTH

In the growing season after pruning, vegetative (leaves, stems, and rhizomes) and reproductive growth (flower bud development) occurs. A grower works to ensure the best crop possible by checking to see that the soil acidity is best for the wild blueberries, plants have the proper nutrition, plants are healthy, and that they have adequate water.

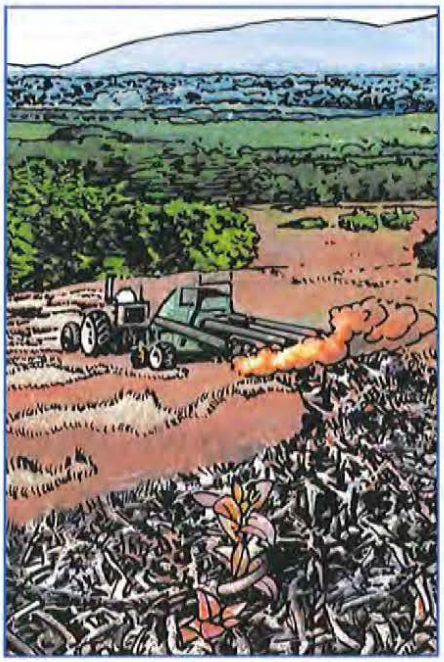
Soil Acidity – Wild blueberries developed in a wild northern climate in glacial soils that are acidic and are adapted to places where other plants have difficulty growing. Blueberries like soils that are acidic. Neutral soil has a pH of 7: lower than 7 it's acidic, and higher than 7 it's alkaline. The best soil pH for blueberries is 4.5. Soils are tested regularly, and if the pH needs to be lowered, sulfur is added.

Fertilization – Growers use leaf tissue samples before a field is pruned to determine what type of fertilizer and the amount of that fertilizer a field needs for the plants to grow and produce well. Proper nutritional management of a crop means healthy plants, prevention of some plant health problems, and excellent blueberry yields. Proper nutritional management ensures that new fields will be established more rapidly, the plants will grow faster, and the fields will have a higher yield of blueberries.

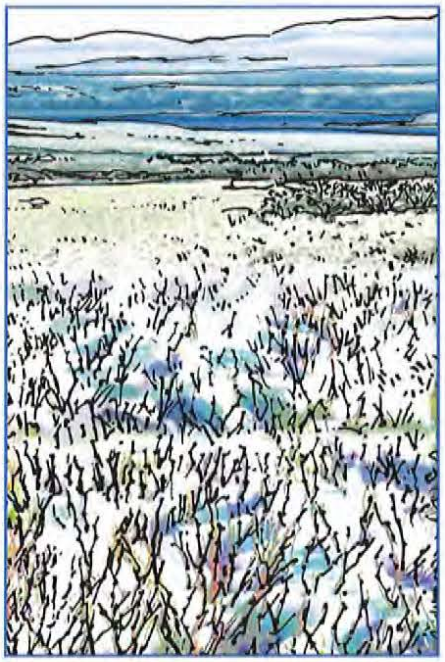
Irrigation – Maine is blessed with adequate amounts of rainfall in most years, usually 45 inches per year. But since it does not always rain when needed, growers have begun to use irrigation to supplement rainfall. In the vegetative growing year, irrigating during dry periods ensures bud formation, which can prevent crop loss due to bud reduction in dry seasons. The use of irrigation in the crop year prevents loss of berry size due to drought. Irrigation is most important during years of drought. However, it is a very expensive undertaking for growers.

BLOOM AND POLLINATION

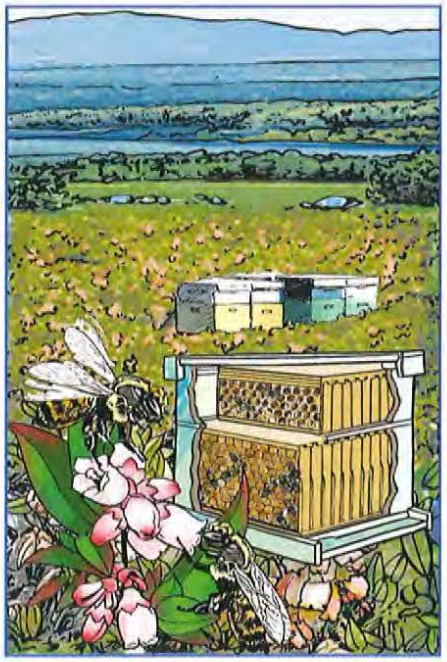
The year following the growing year, the plants flower in May. Bloom lasts two to four weeks. Blueberries need cross-pollination. This means that pollen from a plant cannot fertilize that same plant. Pollen from another plant is needed to fertilize and set fruit on a plant. Insects are needed for this cross-pollination to occur. Pollination by honeybees and other bees yields larger wild blueberry crops. There is more fruit set and wild blueberries are larger because they contain more seeds. Every May more than 65,000 hives of honeybees arrive, each filled with 40,000 to 60,000 honeybees. This will be explored in more detail in another lesson.



Pruning by burning



Winter dormancy



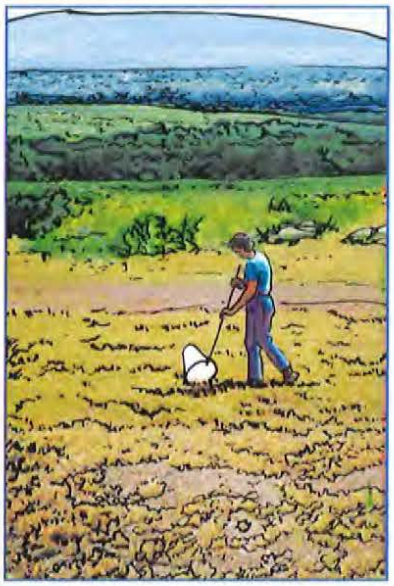
Bloom/pollination

PEST MANAGEMENT

Wild blueberries have several pests and diseases. The pest insects that can reduce blueberry production are the blueberry maggot, the spanworm, the flea beetle, and thrips. The diseases that affect blueberries are mummy berry and blight. Weeds are also a problem. They compete with the blueberry plants for light, water, and nutrients and reduce yields. Weeds can also interfere with the harvest of wild blueberries and reduce their quality.

THE WILD ADVANTAGE—DIVERSITY

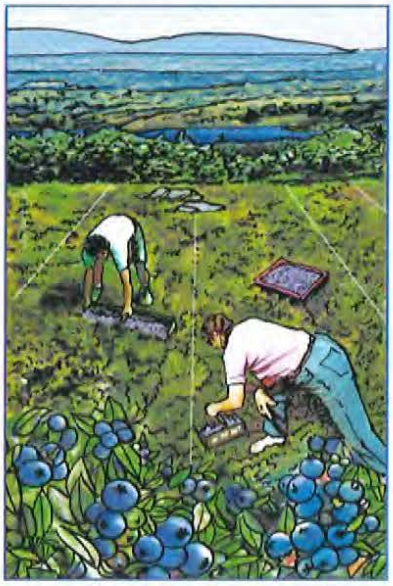
The wild blueberry is a native and naturally established plant that is well adapted to its environment in Maine, Atlantic Canada, and Quebec where it is now managed to produce a commercial crop. The shorter, cooler summer and cold winter reduce insect and disease activity compared to crops grown farther south. Cultivated fruits and vegetables have limited genetic diversity as growers only select and plant a few known varieties that produce well. Because wild blueberries are produced from native clones, the fields have a high degree of genetic diversity compared with cultivated fruits and vegetables. The genetic diversity of wild blueberries means that some clones will be resistant to certain diseases, so an infection will not be as devastating as it would be for other crops which have an identical genetic makeup.



Pest management

LOW MANAGEMENT CROP

Management practices, such as the two-year cropping cycle, also reduce the levels of disease and insect pressure. While the primary purpose of pruning the wild blueberry plant to the ground surface with fire or mowing is to invigorate the wild blueberry and increase its productivity, pruning also serves to disrupt the insect and disease life cycles. Pruning by burning provides an additional benefit of helping to control insects and diseases that reside on the plant residue and soil surface. The adaptation of wild blueberries to a low pH environment and low fertility gives them a competitive advantage over weeds and minimizes the need for fertilizer applications. Compared to many other cultivated crops, wild blueberries need less fertilizer and fewer pesticides.



Stringing the fields/harvesting

CARE FOR THE ENVIRONMENT

Growers use techniques, such as Integrated Pest Management (IPM) and/or Integrated Crop Management (ICM), to minimize the use of chemical pesticides and fertilizers. Both techniques use a variety of cultural and technological practices such as prevention, scouting, testing, barriers, repellents, isolation, spot treating and, when necessary, chemical controls based on economic and environmental factors. IPM focuses on pest management and ICM addresses both pest management and nutrient management. Both techniques seek to manage blueberry fields to the best economic and environmental results using the least amount of chemicals.

PRODUCTION

As previously described, the wild blueberry produces on a two-year cycle. The first year is vegetative growth; the second year is reproductive growth or production of fruit. Once all conditions are met for a good crop, flowers are pollinated, and the fruit is set, growers monitor fields for problems and hope for good weather and a healthy crop.

HARVEST

The wild blueberry harvest begins in July and lasts for four to six weeks. As in the past, many wild blueberries are still harvested with a hand held rake. The berries are combed from the stems by human rakers. The harvest rakes made by one company have remained unchanged since 1910 and are manufactured by the grandson of the original inventor. Other manufacturers have made changes and produce a modified wild blueberry rake.

STRINGING HARVEST LANES

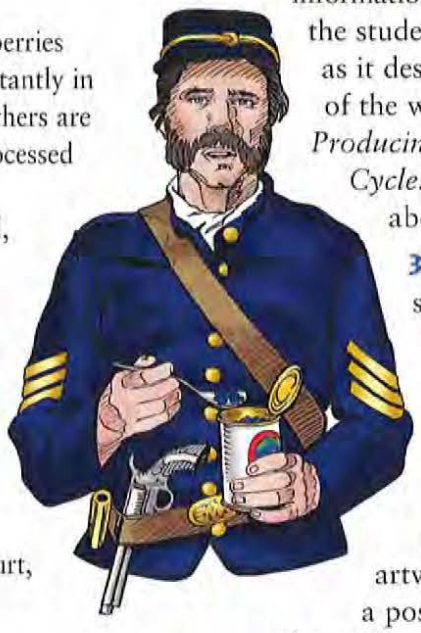
The harvest is conducted with crews of human harvesters called rakers. People come from as far as Canada and Mexico to take part in the harvest. Raking crew leaders mark out harvest lanes eight to ten feet wide in the field a few weeks prior to harvest. Each raker is assigned a lane to rake. These lanes keep the harvest orderly and ensure the whole field is completely harvested.

Machine harvesters are being used by most growers. Rocks have been cleared from many fields and most growers use state-of-the-art machine harvesters to mechanically harvest their wild blueberries.

PROCESSING

From each harvest, only a few of the berries are eaten fresh. Most berries are frozen instantly in quick freeze tunnels, some are dried and others are canned. Most wild blueberries are then processed into a huge array of other products.

Wild blueberries from Maine are dried, canned, frozen and baked into hundreds of food, snack, and beverage products. Maine's wild blueberry crop was first processed into cans during the Civil War and sent to feed the Union Army. Wild blueberries have been a mainstay of the Maine economy for almost 150 years. Wild blueberries are found in muffins, pancakes, pies, ice cream, milkshakes, yogurt, cake mixes, cookies, cereals and also taste wonderful fresh.



PREPARATION

Read through the background information and highlight the sections that you feel appropriate to share with the ability and grade level of your students. Make copies of the artwork and life cycle pages titled *Producing Wild Blueberries – A Two Year Cycle*. NOTE: The bees in the *Wild Blueberry Poster* are not pollinating wild blueberry flowers. They are seeking new flowers to pollinate.

INTRODUCTION

1. Ask the students if they like wild blueberries and what foods they can identify that contain wild blueberries.
2. Write their responses and keep the list in a visible place for this and successive lessons.
3. Ask the students if they know where wild blueberries come from. Tell the class that this lesson will help them learn about Maine's wild blueberries.

ACTIVITY

1. Have the students cut apart the artwork in preparation to sequence it. As they do so, place the poster accompanying this kit in a location visible to the class.
2. Ask the students to listen carefully, they will use the information you are about to give them to conduct this activity. Read the background information that you feel appropriate and ask the students to place the artwork in sequence as it describes the life cycle and production of the wild blueberry or have students read *Producing Wild Blueberries – A Two Year Cycle*. Instruct them to begin thinking about captions for their artwork.
3. Once the students complete their sequence, read the information again to them (or have them re-read it) so that they may create captions for their artwork and write an outline of the process.
4. Have the students write an essay in their own words using the artwork to illustrate the essay or create a poster that accompanies their essay. If the students prefer, they may create their own illustrations.

   Have the students use the essay as the basis for giving an oral report with the poster as their visual aid.
5. As the students give their oral reports, have the other students ask them questions.
6. Ask the students how the production cycle of the wild blueberry is unique. *(Wild blueberries are produced every two years rather than every year.)*
7. Have the students discuss the following questions: What are the different types of wild blueberries and cultivated blueberries? How do they compare? *(See background information.)*

   What problems might a grower encounter? *(Frost, drought, pest infestation, diseases, cold rainy weather during pollination that keeps the bees from pollinating, bears that break into hives, bears that eat wild blueberries, etc.)*

   Why would the wild blueberry growers want to maintain the best quality environment possible? *(They depend upon and live in that environment. Many plan for their children and grandchildren to live and farm there in the future.)*

   Why would wild blueberry growers want to limit their use of chemical fertilizers and pesticides? *(Environmental quality, water quality, expense of fertilizers and chemicals, maintaining production from year to year.)*

EXTENSIONS

1. For older students, share the information about wild blueberry classification and discuss the methods of classifying wild blueberries as you explore this topic in science class.

2. Have the students research wild blueberry products and marketing. What new products could they invent?

3. Invite a wild blueberry grower into the classroom to speak to the students and bring in plant samples, a rake, products, etc.

4. Conduct soil pH tests. Take small samples of soil (1 teaspoon), mix each with a few drops of distilled water, and use pH paper to determine the pH. More extensive soil testing can be conducted with soil testing kits available from biological supply companies.

5. Obtain wild blueberry rhizome cuttings from a grower and have the students start their own plants or grow them from seed.

EVALUATION

1. Assess the thoroughness and accuracy of the essays and oral reports.

2. Evaluate the captions of the artwork for brevity, accuracy, and descriptive nature.

3. Have the class create a rubric to evaluate the posters produced and have the students self-evaluate their products and artwork.

RESOURCES

1. http://www.wildblueberries.maine.edu/

2. http://www.wildblueberries.maine.edu/factsheets/production/220.html

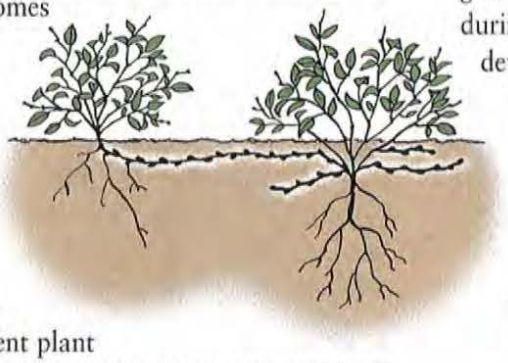
NOTES:

PRODUCING WILD BLUEBERRIES – A TWO YEAR CYCLE

YEAR ONE

Spring – Starting New Plants

Initially, many wild blueberry plants start naturally from tiny seed. Once these plants are established, they send out underground stems known as rhizomes (horizontally spreading stems). Rhizomes grow near the surface of the soil and send up new stems above the soil and roots below that begin a new plant. These new stems are known as a clone because all stems are identical to the parent plant from which the rhizomes grew. One clone can cover from 75 to 250 square feet. An acre of wild blueberries (the size of a football field) may have 200 to 500 different clones.



Summer – Growing Vegetation

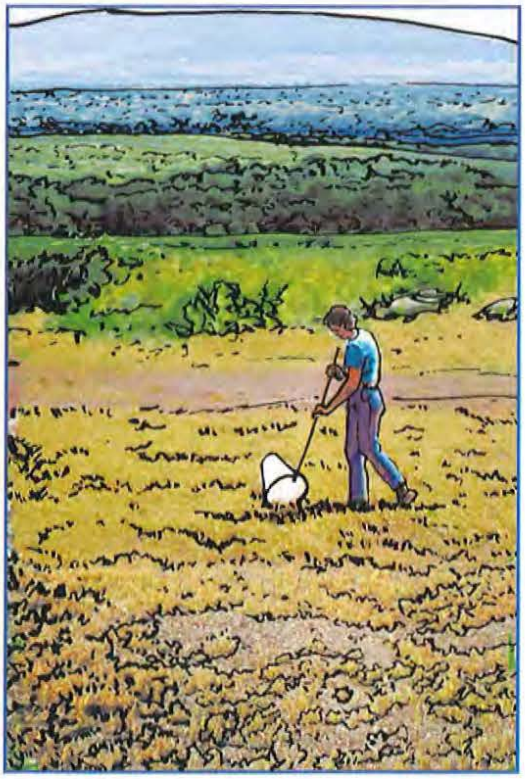
Once the clones develop, they grow strong branches and leaves throughout the summer. The grower makes sure that the plants are healthy and growing well by testing the soil pH (wild blueberries like an acidic soil), fertilizing (if needed), preventing disease, controlling insects, and that adequate water is available. Plant leaf samples are taken to check plant nutrition. Maine is blessed with adequate amounts of rainfall in most years, usually 45 inches per year. But since it does not always rain when needed, growers have begun to use irrigation to supplement rainfall during dry summers. When the plant is growing well it will develop flower buds for next year's fruit.

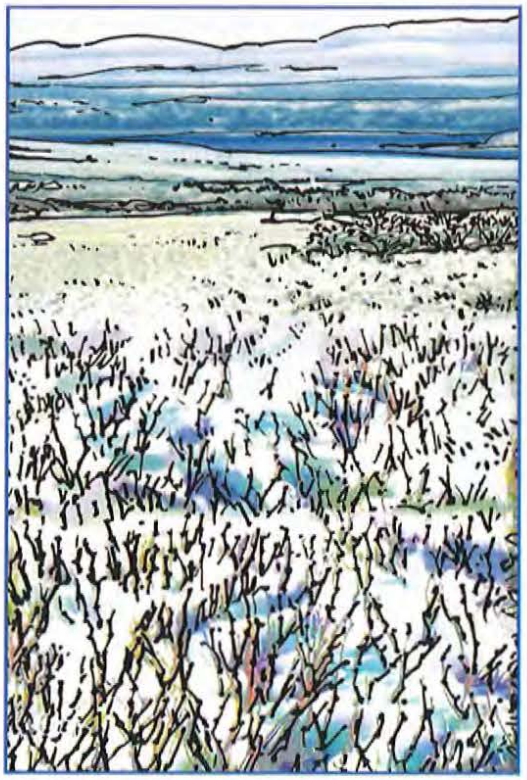
Fall – Preparing for Winter

Once the fruit buds are set and the weather turns cool, the plant prepares for winter by going dormant. The fall color of wild blueberry fields provides a brilliant contrast to the evergreen trees. The plants soon lose their leaves.

Winter – Dormancy

The bare twigs of the wild blueberry plant glisten with snow and ice as winter takes hold. Surviving the cold winds of winter is best done under a protective blanket of snow. Quick temperature changes both up and down can be harmful to the wild blueberry plant and fruit buds. The influence of the ocean on Maine's coastal growing areas helps to lessen these quick changes.





YEAR TWO

Spring – Flowering and Pollination

In the spring, growth resumes with new leaves growing from the buds set last fall.

In May, the wild blueberry plants flower for two to four weeks. Wild blueberry flowers need cross-pollination. This means that pollen from a plant cannot fertilize that same plant. Pollen from another plant is needed to fertilize and set fruit on a plant. Insects are needed for this cross-pollination to occur. Honeybees play a huge role in pollinating wild blueberry fields. Every May more than 65,000 hives of honeybees arrive, each filled with 40,000 to 60,000 honeybees.

Summer – Fruit Development for a Large Crop

Once fruit is set, growers need to ensure that a large crop develops. Growers make sure water is adequate, competition from weeds and insect damage are reduced, and disease is controlled. Wild blueberries have several pests and diseases. Weeds compete with the blueberry plants for light, water, and nutrients and reduce yields. Growers hire scouts to check their fields and alert them to any insect or disease problems. Then action will be taken, if needed. The shorter, cooler summer and cold winter reduce insect and disease activity compared to crops grown farther south. Because wild blueberries are produced from native clones, the fields are more resistant than other cultivated fruits and vegetables. Growers use techniques such as Integrated Pest Management (IPM) and/or Integrated Crop Management (ICM) to minimize the use of chemical pesticides and fertilizers.

Late Summer – Harvest

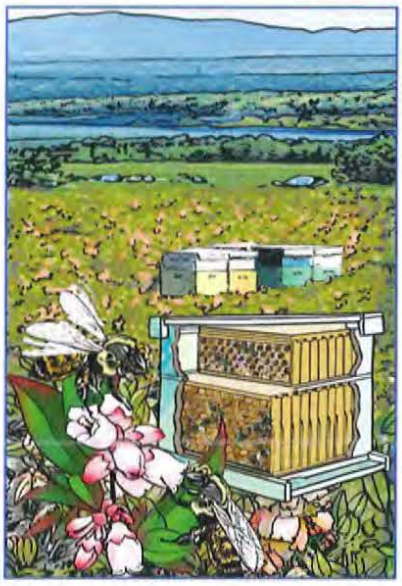
The wild blueberry harvest begins in July and lasts for four to six weeks. Today, most wild blueberries are mechanically harvested with tractor pickers, however a number of fields are still harvested by hand with hand-held rakes that comb berries from the stems. Machine harvesters are being used by most growers. Rocks have been cleared from many fields and most growers now use state-of-the-art machine harvesters to mechanically harvest their wild blueberries. The harvest rakes made by one company have remained unchanged since 1910. Crews of human harvesters that still work in many fields are called 'rakers'. People that staff these harvesting crews come from as far as Canada and Mexico to take part in the harvest. Raking-crew leaders mark out harvest lanes eight to ten feet wide in the field a few weeks prior to harvest. Each raker is assigned a lane to rake. These lanes keep the harvest orderly and ensure the whole field is completely harvested. From each harvest, only a few of the berries are eaten fresh. Most berries are frozen instantly in quick freeze tunnels.

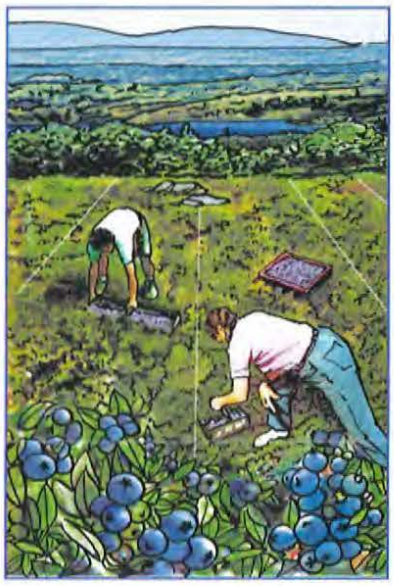
Fall – Pruning

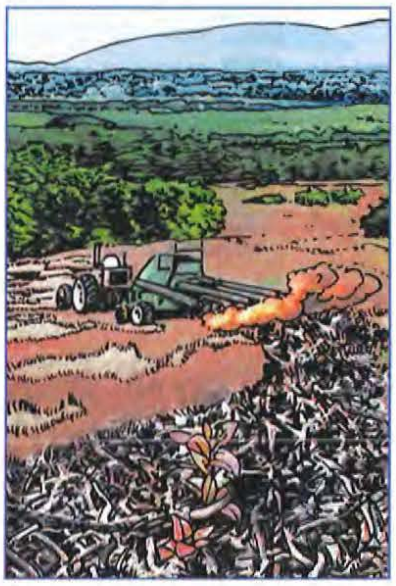
Once the crop is harvested, it is time to prune the plant to the ground with fire or mowing. The purpose of pruning the wild blueberry plant is to invigorate the wild blueberry and increase its productivity. Pruning also serves to disrupt the insect and disease life cycles. Pruning by burning provides an additional benefit of helping to control insects and diseases that reside on the plant residue and soil surface.

Fall and Winter – Processing into Products

Wild blueberries that are frozen at the time of harvest are later dried, canned, and processed into other products throughout the year. The plants in their newly trimmed state will survive the winter and begin again in the spring.







Name_____

LIFE CYCLE

Paste illustrations in order and label them.

YEAR ONE

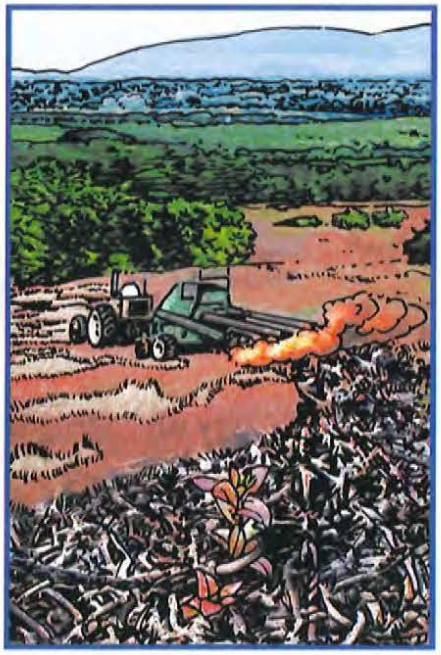
1._____ 2._____ 3._____

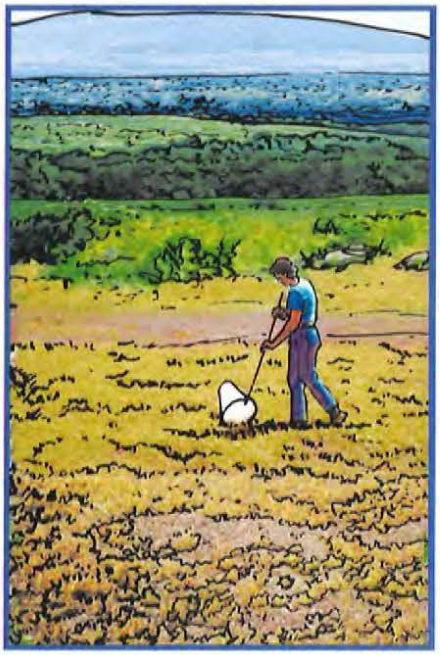
YEAR TWO

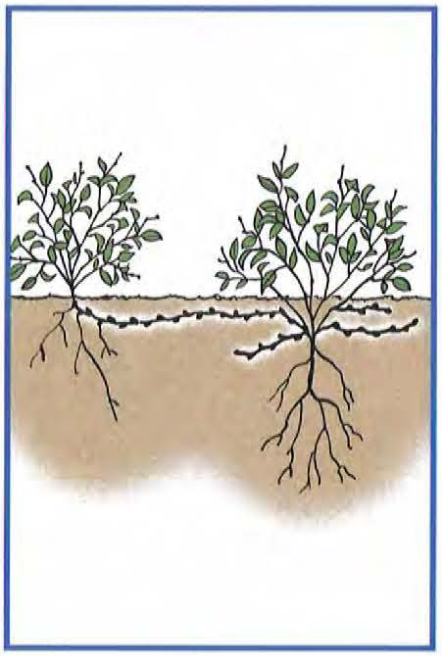
1._____ 2._____ 3._____

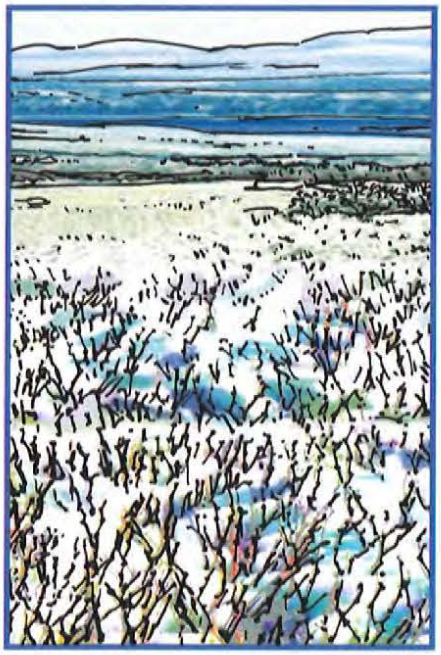
LIFE CYCLE

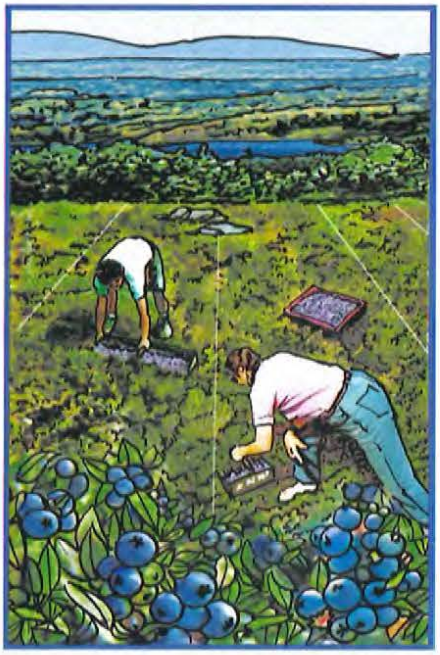
Cut out illustrations and paste them in order on other sheet and label them.

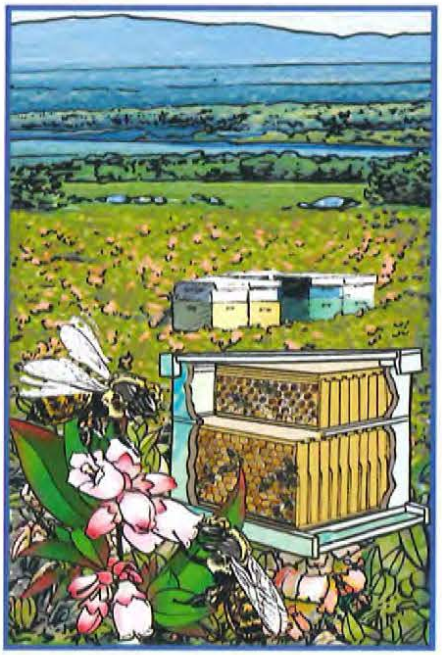










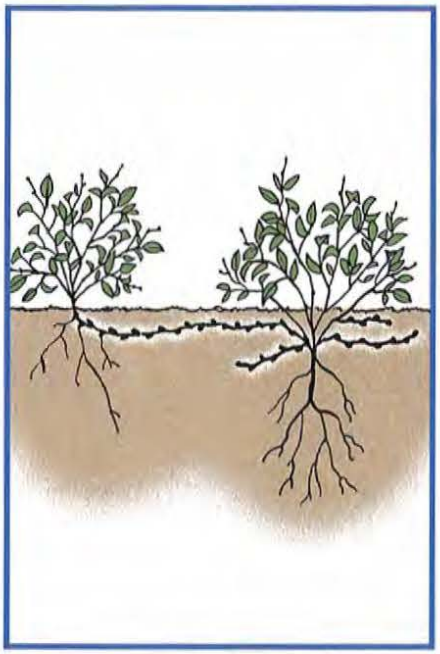


Name *ANSWER KEY*

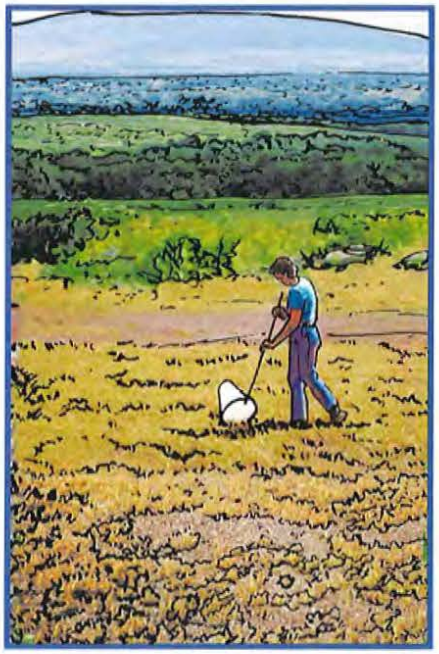
LIFE CYCLE

Paste illustrations in order and label them.

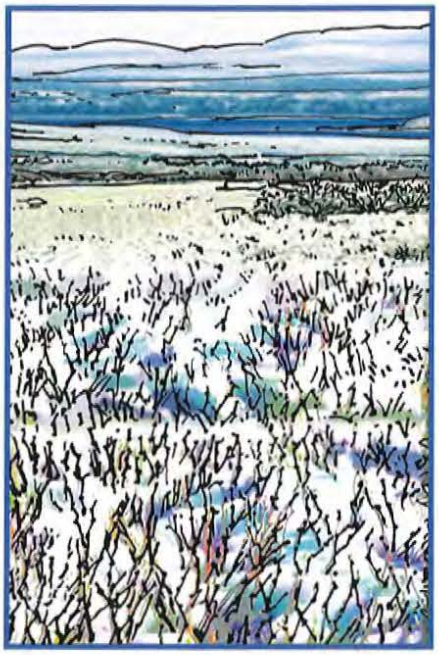
YEAR ONE



Cloning

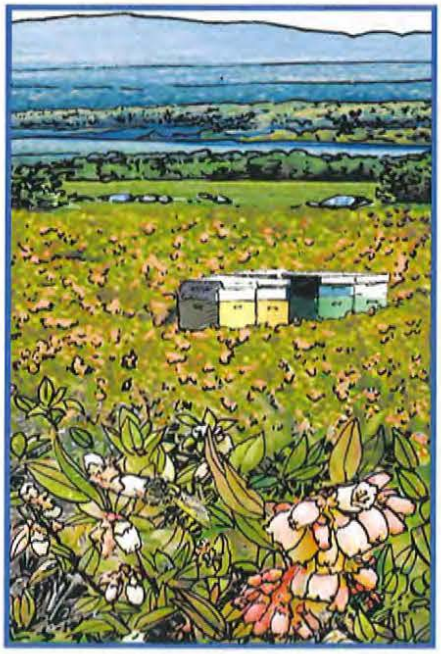


Pest management

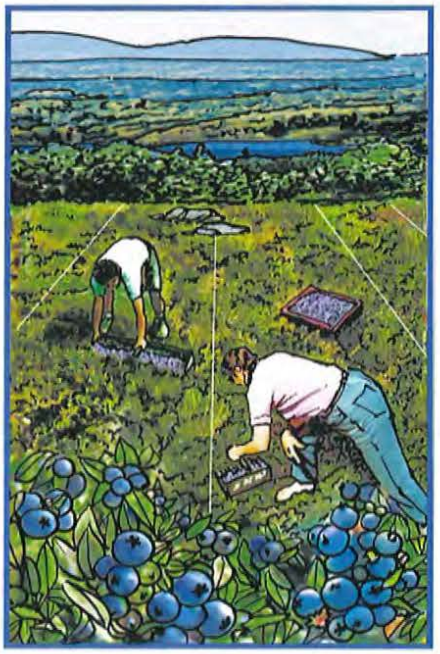


Winter dormancy

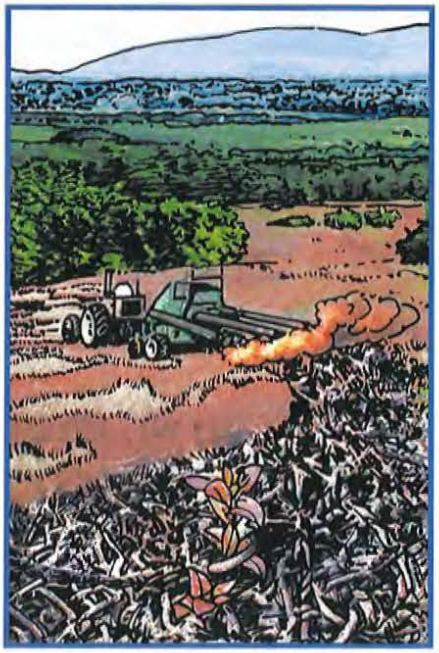
YEAR TWO



Bloom/pollination



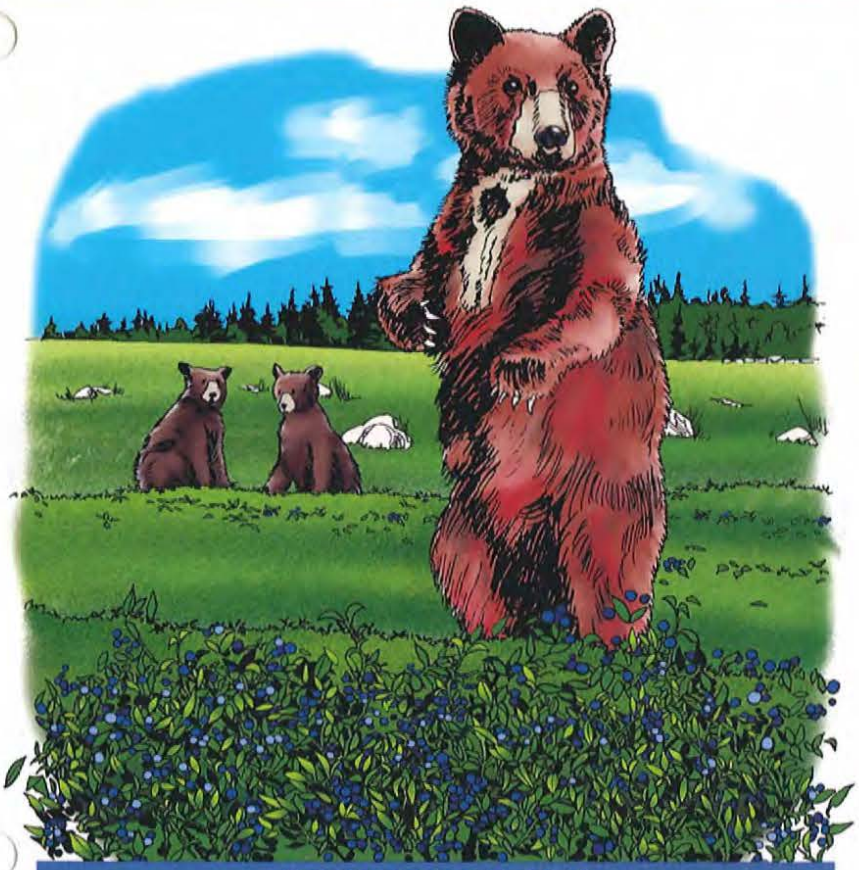
Stringing the fields/harvesting



Pruning by burning

Notes:

ANIMALS AND WILD BLUEBERRIES



BRIEF DESCRIPTION

Students will explore the interaction of several animals with the wild blueberry including, but not limited to, honeybees, bumblebees, black bears and pest insects.

CORRELATIONS TO STATE OF MAINE LEARNING RESULTS: PARAMETERS FOR ESSENTIAL INSTRUCTION

Content Area	Performance Indicator	Grades 3-5 Descriptor(s)	Grades 6-8 Descriptor(s)
English Language Arts	B1	d, e	b, e
	B3	a, b	a
	C1	c, d	b, c, g, h
	E2		a, b, c
Science and Technology	A1	a, b	a, b, c
	A2	a	
	A3	a, b	a
	C3	b	b
	E1	a, b	a, d
	E2	a–e	a, b

OBJECTIVES:

The students will:

1. list and describe several of the animals (other than humans) that interact with wild blueberries.
2. select, research and write a report using traditional and non-traditional sources about one of the following: honeybees, bumblebees, solitary bees, or black bears.
3. complete a word puzzle using appropriate vocabulary.

LIFE SKILLS:

Developing vocabulary, editing, evaluating the credibility of a source of information, evaluating information, reading, researching information, writing

MATERIALS:

- Writing materials
- Copies of the bubblegram and page with flowchart symbols
- Computers with Internet access
- Library reference materials

ESTIMATED TEACHING TIME:

Three 45-minute class periods plus time for research and writing

PREPARATION:

Make copies of the bubblegram puzzle and page with flowchart symbols

VOCABULARY:

Black bears, bumblebees, bush, Canada, clone, cross-pollination, honeybees, irrigation, pollinate, soil, solitary bees

BACKGROUND

Wild blueberries flourish in the acidic, glacial soils and wild northern climate of Maine and Southeastern Canada. Wild blueberries grow naturally in open areas known as barrens. Pine trees are usually found near wild blueberry barrens. They help make the soil acidic for the acid-loving wild blueberry plants. Wild blueberry plants grow naturally once the forest is cleared. While blueberry plants can be planted from seed, rhizome cutting, stem cutting, sod cutting and tissue culture, all wild blueberry commercial fields have been established naturally. Clearing away the forest has allowed humans to expand the growing area of wild blueberries. Rainfall averages 45 inches per year in wild blueberry country. This rainfall is needed to produce a good blueberry crop. Some producers will irrigate their fields if the rainfall is inadequate.

Long before European settlers came to the New World, some forested land had been cleared with fire by Native Americans to let wild blueberry plants grow. These wild blueberry fields were being managed by Native Americans to produce larger crops of blueberries. Native Americans learned that by burning the fields every other year, the plants would thrive, more productive bushes would grow, and fewer insects and diseases would appear, so they could harvest larger crops of wild blueberries.

They taught this technique to the European colonists and shared their barrens. Today many wild blueberry growers, including descendants of the Native Americans, practice those same traditional methods of growing and harvesting that were used for centuries. But now they also incorporate new methods and techniques. Researchers assist by developing new methods to improve wild blueberry production while maintaining a healthy environment. Maine produces 13 percent of all blueberries in North America (cultivated and wild). Maine is the largest producer of wild blueberries in the world. Wild blueberries grow on 60,000 acres in Maine.

PLANT GROWTH

The life cycle of the blueberry begins with new plants. Initially, wild blueberry plants grow from seed. New plants send out underground stems known as rhizomes and create clones. One clone can cover from 75 to 250 square feet. An acre of wild blueberries (the size of a football field) may have from 200 to 500 clones. Once the vegetative growth is complete, the plants set flower buds for the next year and then go dormant for the winter.

BLOOM, POLLINATION AND POLLINATORS

In the spring, growth resumes and the plants flower in May. Most blueberry flowers are pink to white in color and shaped like a bell. Bloom occurs over a two- to four-week period. Blueberries need cross-pollination. This means that pollen from a clone cannot fertilize that same clone. Pollen from another clone is needed to fertilize and set fruit on a plant. Insects are needed for this cross-pollination to occur. The most common pollinator in use is the honeybee, *Apis mellifera*. By using honeybees, there is more fruit set and the wild blueberries are larger because they contain more seed in each wild blueberry. Every May over 65,000 hives arrive, each filled with 40,000 to 600,000 honeybees. It is estimated that over two billion bees are working on the wild blueberry barrens each spring. These honeybees pollinate 30,000 acres of wild blueberry bushes. Some beekeepers come from nearby the wild blueberry barrens. Most are migrants that travel from state-to-state, leasing their hives to farms across the country as their crops bloom and require pollination.

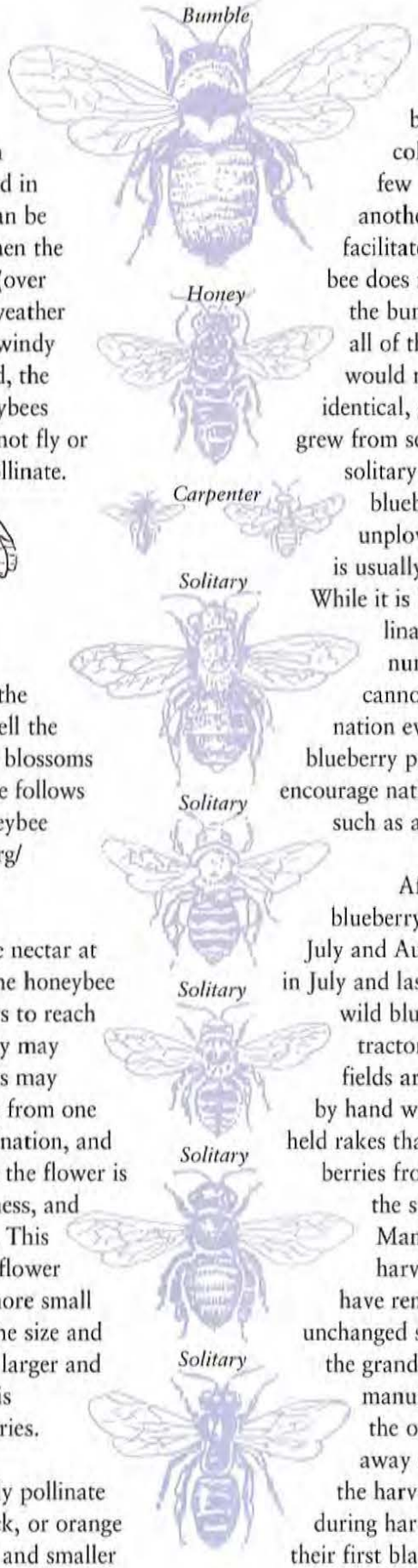
The honeybee is a very industrious insect that will visit more flower types than any other insect. In a single day, a honeybee will make a dozen trips, or more, to and from the hive and may visit more than a thousand flowers. Worker bees visit flowers to

collect both pollen and nectar. Pollen is collected in the dense, branched hair on the bee's body. The bee combs the pollen from the body hair and packs it into pellets on the hind legs. Both pollen and nectar, necessary for food, are stored in the wax comb of the hive. Honeybees can be temperamental. They prefer working when the weather is sunny, warm (over 70°F), and calm. If the weather is wet, windy or cold, the honeybees will not fly or pollinate.

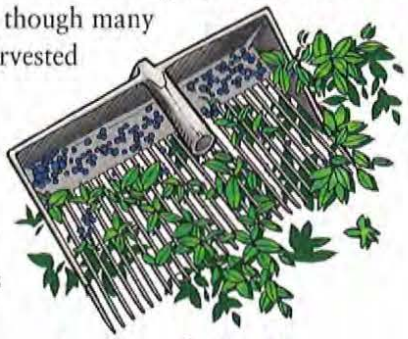
Honeybees are fussy about their blossoms as well. Scout bees check out the field for the most appealing blossoms, tell the other bees back at the hive where those blossoms are in a "dance," and the rest of the hive follows to those bushes first. (Details of the honeybee dance can be found at http://www.pbs.org/wgbh/nova/bees)

The wild blueberry flowers produce nectar at the base of the flower. Insects such as the honeybee must brush past the pollen-laden anthers to reach the nectar. As they leave the flower, they may place a leg on the stigma, or their bodies may brush its sticky surface and leave pollen from one or more other flowers. This causes pollination, and the flower will likely be fertilized. Once the flower is fertilized, it begins to lose its attractiveness, and the ovary begins to develop into a fruit. This is known as fruit set. A well-pollinated flower can result in a berry containing 60 or more small seeds. The number of seeds influences the size and rate of fruit ripening. More seeds cause larger and earlier ripening fruit. Good pollination is essential to a good crop of wild blueberries.

Other bees and insects also naturally pollinate wild blueberries. Large, yellow and black, or orange bumblebees as large as a human thumb and smaller solitary bees pollinate significant numbers of wild blueberry flowers. Bumblebees play a major role in wild blueberry pollination because of their collecting habits. The bumblebee works a few blossoms in one spot and then flies to another spot and works those flowers. This facilitates cross-pollination because the bumblebee does not work clones of its original plant. If the bumblebee stayed in one spot and visited all of the flowers on the clone, cross-pollination would not occur. Remember, the clone is identical, genetically, to the original plant that grew from seed. There are over 59 species of wild solitary bees that have been observed in wild blueberry barrens. These solitary bees nest in unplowed, rough ground. Their flight activity is usually within 200 to 300 yards of their nest. While it is believed that these are the primary pollinators of wild blueberries, their numbers fluctuate from year to year and cannot be relied on to provide adequate pollination every year. Researchers are studying wild blueberry pollination to determine new ways to encourage native bees and introduce new pollinators such as alfalfa leafcutting bees.



After a good fruit set is assured, the wild blueberry bushes produce fruit that is ripe in late July and August. The wild blueberry harvest begins in July and lasts for four to six weeks. Today, most wild bluberries are mechanically harvested with tractor pickers though many fields are still harvested by hand with hand held rakes that comb berries from the stems. Many of the harvest rakes have remained unchanged since 1910 and are manufactured by the grandson of the original inventor. Other manufacturers have made adaptations to the original rake. People come from as far away as Canada and Mexico to take part in the harvest. Another animal enters the picture during harvest, the black bear. Many pickers have their first black bear sighting during harvest.



BLACK BEARS AND WILD BLUEBERRIES

Wild blueberries ripen just at the time that bears are searching for food to give them the energy that is converted into body fat for their winter hibernation. Bears have been known to travel 10 to 15 miles in a day to find a rich wild blueberry patch.

Stories of close encounters with bears on Maine's rocky barrens abound. In Pauline W. Moore's *Blueberries and Pulsey Weed: The Story of Lovell, Maine*, she writes:

> *When 'Went A-Blueberrying' was recorded it was really summer. Blueberries were plentiful, especially where the land had been burned over...*
>
> *If it had been an extremely dry summer, the berry pickers had to watch out for bears that stood up on their hind legs and reached for the big ones just as the humans did. Many bears have been seen by blueberry pickers but never has anyone been hurt. Both the bears and humans run as fast as possible, the only difference being that the human drops a basket full of his best berries.*

From BLUEBERRIES FOR SAL by Robert McCloskey, copyright 1948, renewed (c) 1976 by Robert McCloskey. Used by permission of Viking Penguin, an imprint of Penguin Putnam Books for Young Readers, a division of Penguin Putnam Inc.

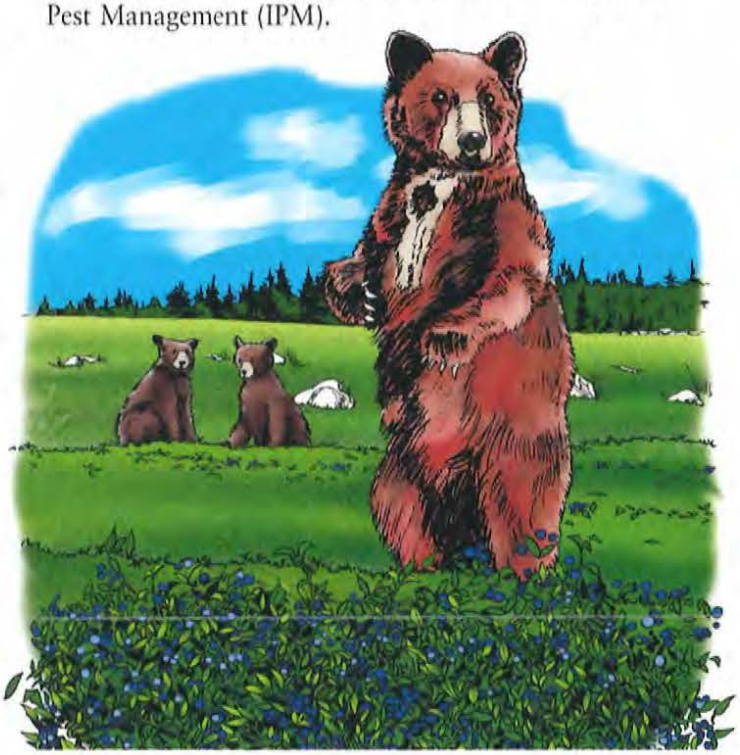
Nor can we ignore the unforgettable impact that *Blueberries for Sal* has had on young children across the United States. In the book, a young girl in Maine wanders away from her mother while blueberry picking to come face-to-face with a mother black bear whose cub has also wandered away to come face-to-face with Sal's mother. Other interesting accounts of humans and bears looking for wild blueberries in the same berry patch can be found in town and family histories. Harvest time is not the only time that bears have an interest in the wild blueberry barrens. Many beekeepers have been visited, much to their dismay, by a bear keen on making his or her own harvest of wild blueberry honey and larvae made by the occupants of the visiting hives. Although beekeepers use electric fences to protect the hives, it seems that the bears always find some hives. One story recounts a small trailer stacked high with hives that was left out overnight. When the beekeeper returned in the morning, the trailer was gone. But there were bear tracks that led into the woods. Several men followed the tracks and eventually found the hives and trailer. The bear had pulled it into the woods for a leisurely feast of wild blueberry honey.

AFTER HARVEST

Only a few of the berries harvested are eaten fresh. Most berries are frozen instantly in a quick-freeze tunnel, some are dried and others are canned. Most wild blueberries from Maine are then processed into a huge array of other products. Wild blueberries from Maine that are dried, canned and frozen are baked into hundreds of foods and snacks and made into beverage products. Wild blueberries are found in muffins, pancakes, pies, ice cream, milkshakes, yogurt, cake mixes, cookies, cereals and also taste wonderful fresh.

OTHER ANIMAL AND WILD BLUEBERRY INTERACTIONS

Wild blueberries have several pests and diseases. The insects that can reduce blueberry yield are the blueberry maggot, the blueberry spanworm, the flea beetle, sawflies, grasshoppers, blueberry leaf beetles, the strawberry rootworm, and thrips. Growers control these pest insects with a combination of cultural, mechanical, biological, and chemical controls known as Integrated Pest Management (IPM).



PREPARATION

- Read through the background information and highlight the sections that you feel appropriate to share with the ability and grade level of your students. Also add information from the previous lesson if needed.
- Make copies of the ***Bubblegram*** activity page and symbol page.
- Have students retain the handout, ***Producing Wild Blueberries – A Two Year Cycle,*** from the previous lesson.
- Have the school librarian obtain copies of the Blueberry Pest Fact Sheets listed in the reference section or find them on the Internet and make copies.

ACTIVITY ONE

1. Have the students refer to the handout, ***Producing Wild Blueberries – A Two Year Cycle,*** from the previous lesson. Share with the class the portions of the supporting information that you feel appropriate for your students' ability level that are in addition to the information in the handout. Make a list on the board of the animals that interact with wild blueberries, including human interaction.

2. Ask the students to select one of these animals, research it using traditional and non-traditional methods, and write a report about it. For older students, perhaps a blind selection process should be used to insure that as many animals are covered as possible and everyone does not select only black bears or honeybees, for example. A listing of Web sites is provided in the reference section of the lesson. Ask the students to include illustrations, if possible.

3. Have older students use these reports as the basis for an oral presentation of their findings.

ACTIVITY TWO

1. Have the students create flowcharts of the production cycle of the wild blueberry. This should cover the two-year cycle and include inputs and outputs. As a class, determine what geometric figures to use. For example, rectangles could indicate the stages of the plant's life cycle, circles could be used to indicate inputs of fertilizer, lime or sulfur, etc.

2. Select a symbol, such as an inverted triangle, to indicate animal interactions, both positive and negative.

3. Have the students indicate all outputs including honey production from the beekeepers.

4. Once the flowcharts are complete, discuss whether all factors have been considered. Ask:

   Are research and scientists included?

   Is education included? How do growers learn about new techniques and technology?

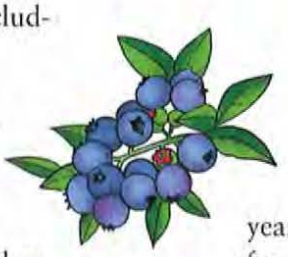
   Have you followed the wild blueberries to the consumer and are all of the businesses that are involved included? Is marketing included? Are grocery stores included? Etc.

ACTIVITY THREE

1. Have the students complete the ***Bubblegram*** and find the mystery word.

2. A Word Bank is provided for younger students to select from in completing the activity. If this is not needed for the students, remove it from the page before copying.

EXTENSIONS



1. Divide the class into small groups and give each group a segment of the process about which to develop a flowchart. One group is given the first year of growth, another the second year of growth, another harvest and transportation to a processing plant, another processing into finished products, and the last marketing. Have the students create their flowcharts using the computer.

2. Make the flowchart an economic flowchart that indicates the flow of money and includes credit, interest and businesses involved through to the consumer. A page of symbols is included for student use.

3. Invite either a Cooperative Extension educator or wild blueberry producer into the class to tell about his/her business and career.

4. Have students develop their own crossword puzzle, acrostics, word finds, etc. Have them make clean copies of their puzzles on a computer; compile these into a booklet of blueberry word puzzles; illustrate the booklet with line drawings; make copies and provide them to the whole class.

EVALUATION

1. Assess the thoroughness and accuracy of reports produced. The amount of information will vary a great deal, and this should be taken into consideration.

2. Assess the thoroughness and accuracy of the flowcharts produced.

3. Use the vocabulary as spelling words or for a vocabulary quiz.

4. Evaluate the accuracy of the answers on the BUBBLEGRAM.

5. Use any of the extension activities as further evaluation activities or to produce materials for student portfolios.

RESOURCES / WEB SITES

Extension Information
http://www.wildblueberries.maine.edu
http://pmo.umext.maine.edu/

BLACK BEAR WEB SITES

http://www.nature-net.com (search for black bears)
http://www.garlynzoo.com/index.htm (go to "animal video clips" or "more animal pictures")
http://www.tpwd.state.tx.us/huntwild/wild/species/blackbear/

HONEYBEE WEB SITES

Tales From the Hive
http://www.pbs.org/wgbh/nova/bees

Beekeeping
http://edis.ifas.ufl.edu/AA088

NASS Report
http://gears.Tucson.ars.ag.gov/

National Honey Board
http://www.honey.com

OTHER BEES AND GENERAL ENTOMOLOGY TOPICS

BugBios, Insects on the Web
http://insects.org/

Bumblebees
http://www.farminfo.org/bees/bumble-bees-m.htm
http://Hercules.users.netlink.co.uk/Bee.html

General
http://web.ento.vt.edu/ento/

BOOKS ON THE AMERICAN BLACK BEAR (URSUS AMERICANUS)

Bunnell, Fred. "American Black Bear." *The Encyclopedia of Mammals.* Ed. D. Macdonald. New York: Facts on File, 1993.

Burt, William H. *Peterson Field Guide Series: A Field Guide to the Mammals of North America.* Third edition. Boston: Houghton Mifflin Co., 1980.

McCracken, Catherine, D. A. Rose, K.A. Johnson. *Status, Management, and Commercialization of the American Black Bear.* Washington, DC: World Wildlife Fund – TRAFFIC USA, 1995.

Nowak, Ronald M. *Walker's Mammals of the World.* Volume 2. 5th edition. Baltimore: Johns Hopkins University Press, 1991.

United States Fish & Wildlife Service. "Wildlife Biologue: American Black Bear." U.S. Department of the Interior – USFWS, 1995.

Ward, Paul and Suzanne Kynaston. *Wild Bears of the World.* New York: Facts on File, Inc., 1995.

Wexo, John Bonnett. *ZooBooks: Bears.* San Diego: Wildlife Education, Ltd., 1993.

COOPERATIVE EXTENSION PUBLICATIONS

Available from the University of Maine at Orono or on the Web at http://www.wildblueberries.maine.edu

Blueberry Flea Beetle
Fact Sheet No. 200, Bulletin 2372

Blueberry Leaf Beetle
Fact Sheet No. 203, Bulletin 2369

Blueberry Sawfly
Fact Sheet No. 206, Bulletin 2285

Blueberry Spanworm
Fact Sheet No. 197, Bulletin 2371

Blueberry Thrips
Fact Sheet No. 202, Bulletin 2373

Commercial Bumble Bee Management
Fact Sheet No. 302, Bulletin 2421

Field Conservation Management of Native Leafcutting and Mason Osmia Bees
Fact Sheet No. 301, Bulletin 2420

Grasshoppers
Fact Sheet No. 198, Bulletin 2368

Honeybees and Blueberry Pollination
Bulletin 629

Monitoring for the Blueberry Maggot
Fact Sheet No. 201, Bulletin 5053

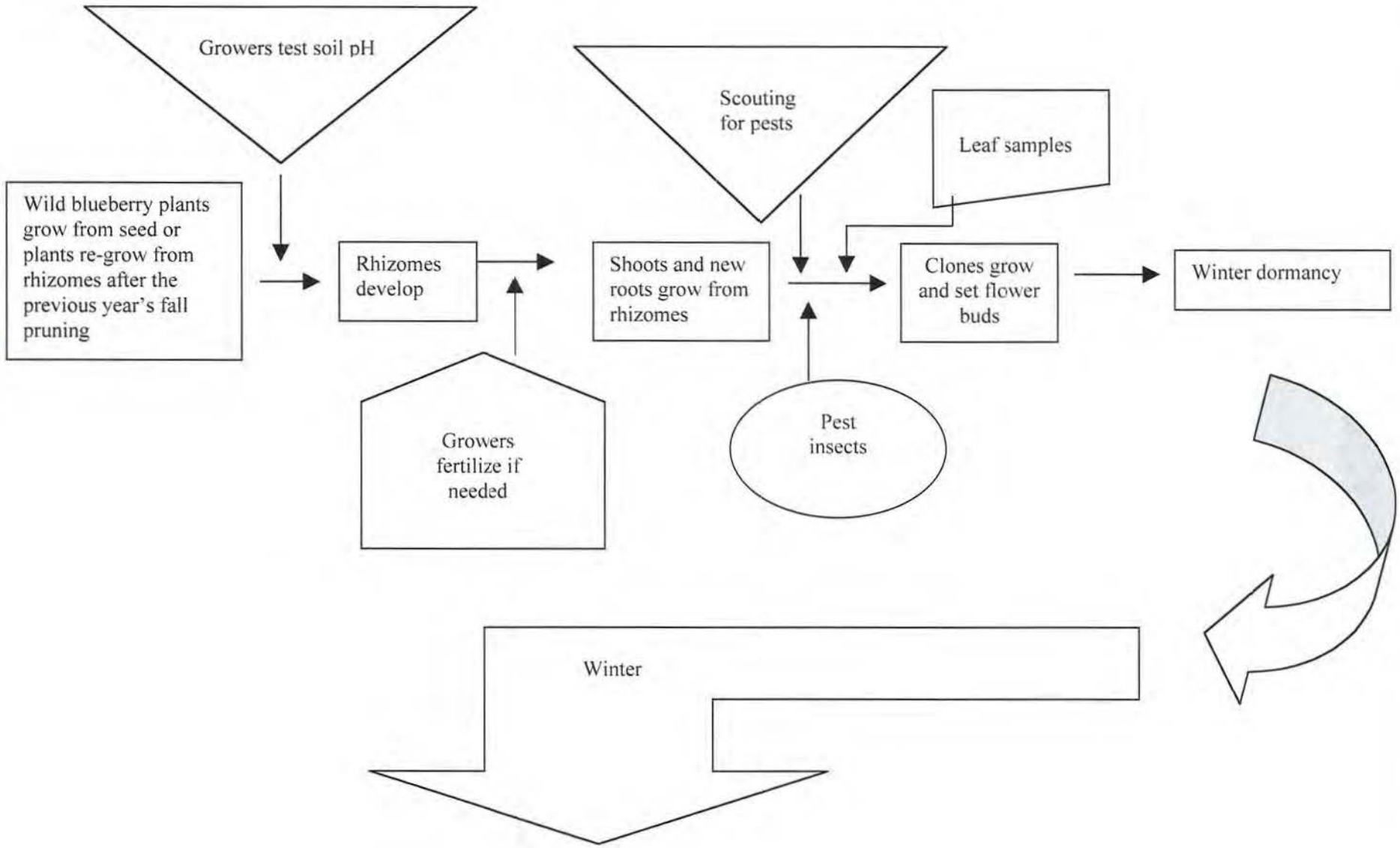
Red-Striped Fireworm
Fact Sheet No. 205, Bulletin 2284

Strawberry Rootworm
Fact Sheet No. 199, Bulletin 2370

NOTES:

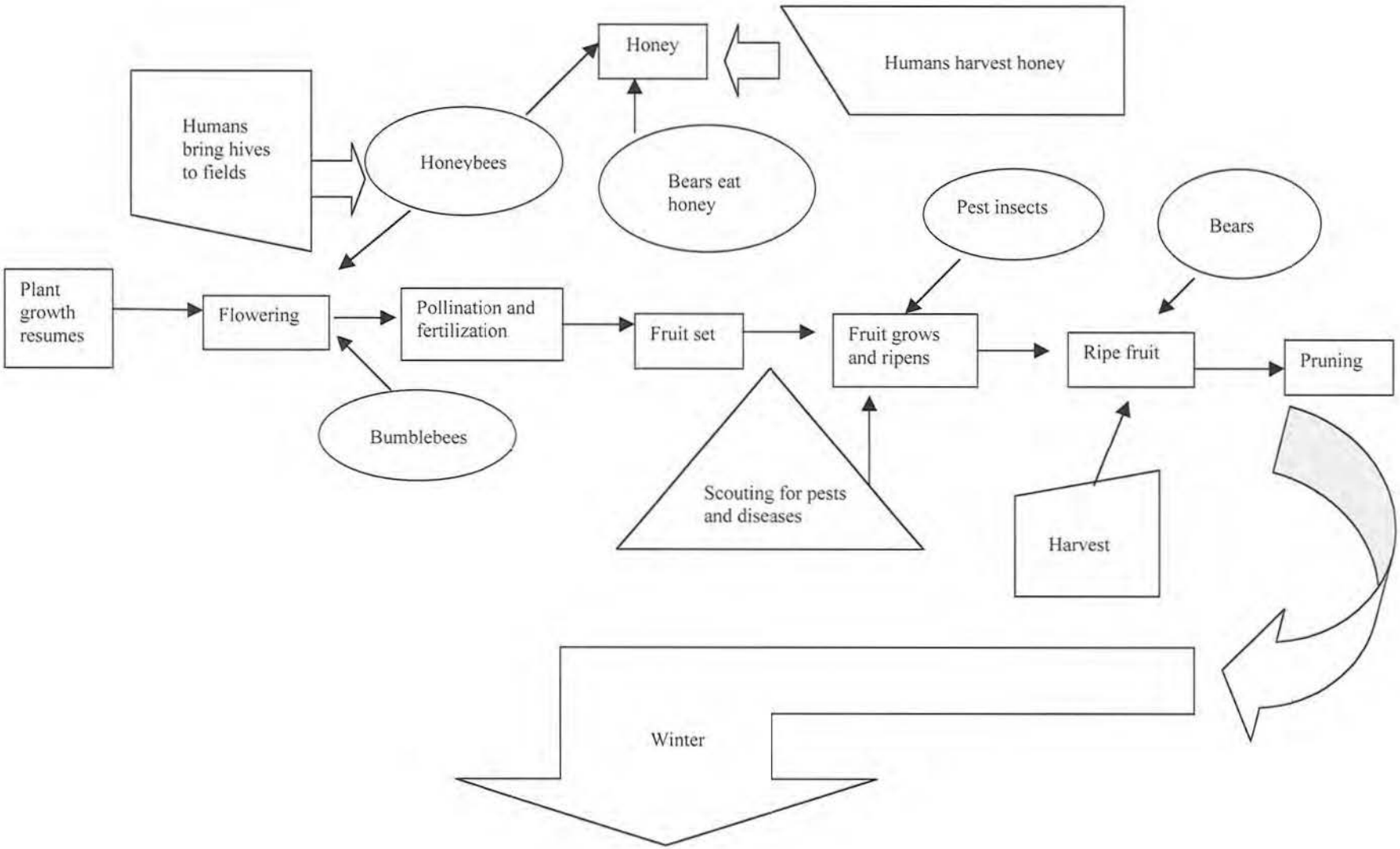
SAMPLE FLOWCHART

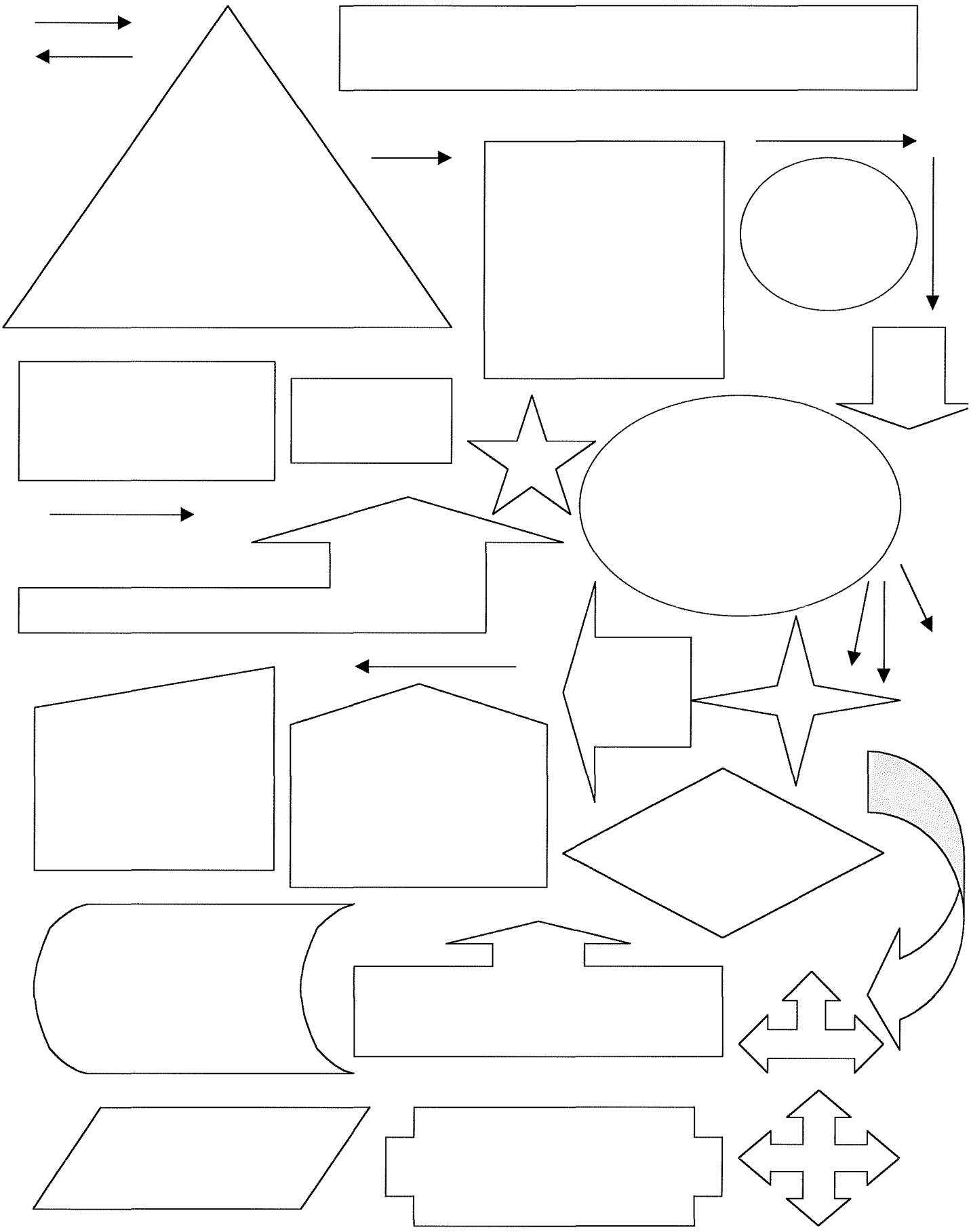
FIRST YEAR OF GROWTH



SAMPLE FLOWCHART

SECOND YEAR OF GROWTH





Name _____

WORD BANK

Black bears, bumblebees, bush, Canada, clone, honeybees, irrigation, Maine, pollinate, rain, soils, solitary bees, travel, warm, white

BUBBLEGRAM

Solve these puzzle questions by placing the correct word to complete the sentence to find the bubblegram mystery word.

1. ___ ___ ___ ___ ◯ ___ ___ ___ ___

2. ___ ___ ___ ___ ◯ ___ ___

3. ___ ___ ___ ___ ___ ◯ ___ ___ ___ ___ ___ ___

4. ___ ___ ___ ___ ___ ◯ ___

5. ___ ___ ___ ___ ___ ◯ ___ ___ ___ ___

6. ___ ___ ◯ ___ ___ ___ ___

7. ___ ___ ◯ ___ ___ ___

8. ___ ___ ___ ___ ◯ ___ ___ ___ ___

9. ___ ___ ___ ___ ___ ___ ___ ___ ___ ◯ ___ ___ ___

10. ___ ___ ___ ___ ___ ◯

11. ___ ___ ◯ ___ ___ ___ ___ ___

12. ___ ___ ◯ ___ ___ ___

13. ___ ___ ___ ___ ___ ___ ___ ___ ◯ ___ ___

14. ___ ___ ___ ___ ___ ___ ___ ___ ___ ◯

15. ___ ___ ___ ___ ___ ◯ ___ ___ ___ ___ ___

BUBBLEGRAM CLUES

1. Honey bees like the weather to be sunny, _____, and calm when they work.

2. Wild blueberries that grow in _____ and Canada are one of only four fruits native to North America.

3. Large _____, colored yellow and black or sometimes orange, the size of your thumb, are a second type of insect that is known to pollinate wild blueberry flowers. These bees will work in cooler temperatures, earlier in the morning, and even in moderately heavy rain.

4. In addition to Maine, the world's other wild blueberry producer is _____.

5. The large _____ is a mammal that loves to eat wild blueberries. In the past many wild blueberry pickers have seen this mammal in the barrens.

6. A new wild blueberry will send out rhizomes and produce new plants that are _____s of the original plant. Each of these is genetically identical to its parent plant.

7. Most wild blueberries are produced on a low-growing _____ .

8. The most popular wild blueberry pollinator is the _____ . Growers actually lease colonies to come to their fields for this purpose.

9. _____ also pollinate wild blueberries but are less well known.

10. Wild blueberry flowers can be either pink or _____ .

11. Bears have been known to _____ 10-15 miles per day to find a rich wild blueberry patch.

12. Maine usually receives 45 inches of _____ per year in wild blueberry country. This is needed for a good crop.

13. Some producers may supplement rainfall particularly in drought years with _____ .

14. Wild blueberry flowers require assistance from bees and other insects to _____ their flowers with pollen from another plant in order to set fruit.

15. Maine and southeastern Canada have _____ that are acidic and just right for the production of wild blueberries.

ANSWER KEY

BUBBLEGRAM

Solve these puzzle questions by placing the correct word to complete the sentence to find the bubblegram mystery word.

1. (W) A R M
2. M A (I) N E
3. B U M B (L) E B E E S
4. C A N A (D) A
5. B L A C K (B) E A R
6. C (L) O N E
7. B (U) S H
8. H O N (E) Y B E E
9. S O L I T A R Y (B) E E S
10. W H I T (E)
11. T (R) A V E L
12. (R) A I N
13. I R R I G A T (I) O N
14. P O L L I N A T (E)
15. (S) O I L S

NOTES:

Health and Nutrition – Wild Blueberry Style

Brief Description

The students will learn about nutrition labeling and the nutritional value and other health benefits of wild blueberries, and design their own nutritious, wild blueberry food product with a nutrition label.

Correlations to State of Maine Learning Results: Parameters for Essential Instruction

Content Area	Performance Indicator	Grades 3-5 Descriptor(s)	Grades 6-8 Descriptor(s)
English Language Arts	F1	b	
Health Education and Physical Education	A1 A6 B1 B2 C1	 a	a b
Social Studies	A2	b	b

Objectives:

The students will:

1. describe and accurately read a nutrition label.
2. describe the nutritional value of wild blueberries.
3. describe the latest health benefits beyond nutrition (including antioxidants) that scientists are discovering in wild blueberries.
4. design their own nutritious, wild blueberry food product, complete with a nutrition label.

Life Skills:

Analyzing, comprehending, developing creativity, reading for information, making nutritious food choices

Materials:

- Copies of the *USDA MyPyramid*
- Copies of the *USDA MyPyramid for Kids*
- Copies of *Reading Nutrition Labels*
- Ingredients for *Purple Cows,* if desired

Estimated Teaching Time:

Three to four 45-minute class periods

Preparation:

Make copies of the food guide pyramids and nutrition labeling activity sheet. Gather ingredients for *Purple Cows,* if desired.

Vocabulary:

Calories, cholesterol, dietary fiber, fat, nutrients, nutrition, vitamins, minerals, sodium, antioxidant

BACKGROUND

From the time that humans first harvested wild blueberries and included them in their diets, they have been accepted as a nutritious food. Wild blueberries contain many essential nutrients. Those nutrients are vitamins, minerals, and carbohydrates. Wild blueberries also contain fiber. Wild blueberries are an excellent source of vitamin C. They have no cholesterol or sodium and are low in calories.

Scientists are now discovering that the health benefits of wild blueberries are much greater than just the nutrients they contain. Recent studies indicate that the pigment that gives wild blueberries their distinctive deep-blue color is a natural antioxidant. The pigment is called anthocyanin (an-tho-sy-ann-in). Antioxidants are substances that help protect the body against cancer, heart disease and the effects of aging. They are linked to better eyesight, circulation and cancer prevention. In fact, United States Department of Agriculture (USDA) research shows that of 40 fruits and vegetables studied, blueberries rank number one in antioxidant activity. See the fact sheets and brochures included with this kit for additional information on this topic.

Nutrition Facts

Serving Size: 5 ounces or 140g (1 cup) of Wild Blueberries

Amount per serving

Calories 60	**Calories from fat** 0
	% Daily Value*
Total Fat 0g	**0%**
Saturated Fat 0 g	
Trans Fat 0 g	
Cholesterol 0 mg	**0%**
Sodium 0 mg	**0%**
Potassium 95 mg	**3%**
Total Carbohydrate 18 g	**6%**
Dietary Fiber 6 g	**25%**
Soluble Fiber 2 g	
Insoluble Fiber 4 g	
Sugars 10 g	
Protein 0 g	

Vitamin A 2% • Vitamin C 4% • Calcium 2% • Iron 4%
Vitamin E 2% • Thiamine 2% • Riboflavin 0% • Niacin 4%
Vitamin B6 2% • Phosphorus 2% • Magnesium 2%
Zinc 8% • Manganese 200%

*Percent Daily Values are based on a 2,000 calorie diet.

A basic nutritional fact sheet for students is included with this lesson to supplement and/or review nutrition lessons traditionally taught.

INTRODUCTION

1. Introduce any unfamiliar vocabulary and have the students research their definitions.

2. Review any previous nutritional instruction or use the handout on nutrition to cover the basics.

ACTIVITY ONE

1. Hand out copies of the *USDA MyPyramid,* one per student. Ask the class to identify where wild blueberries would be placed in the pyramid. *(Fruit Group)*

2. Hand out the *USDA MyPyramid for Kids.* Ask the students to compare and contrast it with the previous version. What are the differences? What are the similarities? What foods do young children need in different quantities from students in your class and what age level is this second food guide pyramid appropriate for? Why?

3. Take the list of foods made with blueberries previously developed in the *Producing Wild Blueberries* lesson and categorize each one on both pyramids.

ACTIVITY TWO

1. Hand out copies of the *Reading Nutrition Labels* activity sheet, one per student. Ask the class to complete the activity sheet.

2. Discuss the answers.

3. Present the additional information about the health benefits of wild blueberries beyond nutrition, antioxidant properties, protection against heart disease, cancer and other diseases of aging, etc., as appropriate for the ability level of your class.

4. Have students conduct Internet research to further explore antioxidants, pigments, flavonoids, etc., that are now being discovered and researched.

ACTIVITY THREE

1. Have the students divide into small groups. Ask each group to develop a wild blueberry product, formulate a recipe or bring one in from home, design the package, create a nutrition label, and decide how to market the product in conjunction with the lesson on advertising.

2. Ask the school cafeteria to include some of the students' recipes with the school lunch.

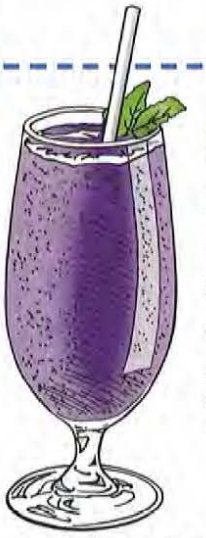
3. Make some wild blueberry products as a class project: dry wild blueberries to make wild blueberry raisins, freeze wild blueberries into small snack packs and eat them as a frozen snack, make wild blueberry popsicles, wild blueberry smoothies or make Purple Cows.

WILD BLUEBERRY RECIPES

Wild Blueberry Smoothies*

Ingredients:
¾ cup Wild Blueberries
¾ cup Vanilla or Blueberry Yogurt
1 tablespoon Honey
3 Ice Cubes

Blend at high speed. Serve immediately. Serves 2.



Purple Cows*

Ingredients:
1½ gallons Milk
13⅓ cups Wild Blueberries
3 tablespoons Sugar

Combine all ingredients in a blender and blend at high speed until smooth.
Yield: 30, 8-oz. servings

Teacher's Note: Some students may be lactose intolerant. If so, please suggest appropriate alternatives. Lactaid milk or soy milk may be used in place of regular milk. If available, soy yogurt may be used as a substitute for regular yogurt.

* Source: Wild Blueberry Association of North America

EXTENSIONS

1. Have the students read nutrition labels from a variety of other products. Compare these with what they have learned about wild blueberries.

2. Current research is reporting new discoveries such as nutraceuticals in foods. Have students research and write reports about the topic "Nutraceuticals," using the natural benefits of food to prevent or cure diseases, enhancing natural chemicals in foods for these benefits, etc. Information can be found on the Internet, nightly news reports, magazine articles, etc.

3. Have the students create a Venn diagram of foods that depicts how one food may provide a variety of nutrients.

4. Make classroom cooking projects: fruit salads, wild blueberry yogurt, wild blueberry milkshakes, etc.

EVALUATION

1. Assess the accurate completion of the ***Reading Nutrition Labels*** activity sheet.

2. Have the students write an essay titled "The Health Benefits of Wild Blueberries." Ask them to include information beyond the nutritional benefits and grade accordingly.

3. Assign group grades for the wild blueberry food projects with the emphasis on the nutrition labeling component.

4. Combine this activity with the advertising activity and include the projects in a portfolio assessment.

RESOURCES

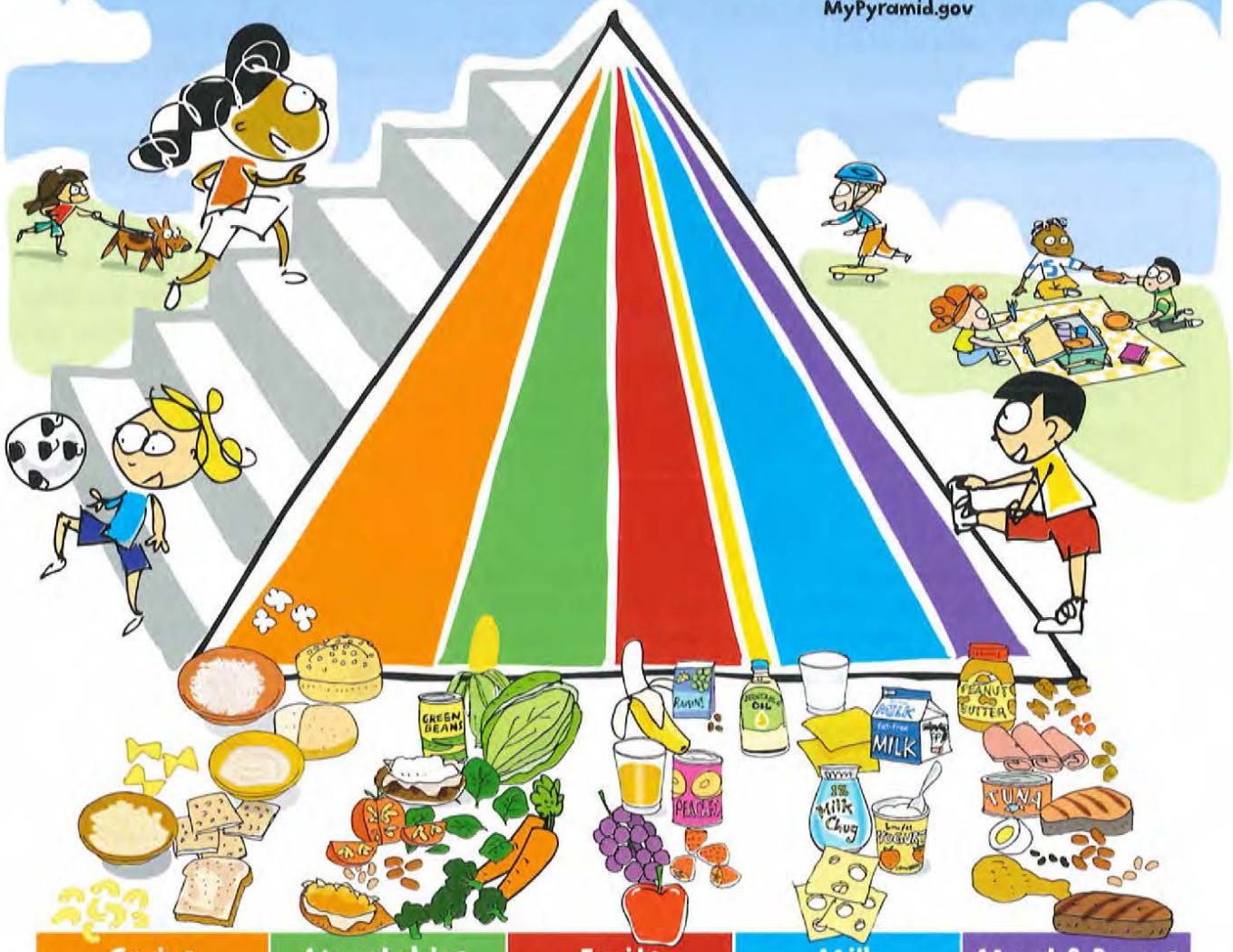
USDA MyPyramid and USDA *MyPyramid for Kids*, Center for Nutritional Policy Promotion, United States Department of Agriculture. Washington, DC. http://www.cnpp.usda.gov/

NOTES:

MyPyramid For Kids

Eat Right. Exercise Have Fun.

MyPyramid.gov



Grains
Make half your grains whole

Start smart with breakfast. Look for whole-grain cereals.

Just because bread is brown doesn't mean it's whole-grain. Search the ingredients list to make sure the first word is "whole" (like "whole wheat").

Eat 6 oz. every day; at least half should be whole

Vegetables
Vary your veggies

Color your plate with all kinds of great-tasting veggies.

What's green and orange and tastes good? Veggies! Go dark green with broccoli and spinach, or try orange ones like carrots and sweet potatoes.

Eat 2 ½ cups every day

Fruits
Focus on fruits

Fruits are nature's treats – sweet and delicious.

Go easy on juice and make sure it's 100%.

Eat 1 ½ cups every day

Milk
Get your calcium-rich foods

Move to the milk group to get your calcium. Calcium builds strong bones.

Look at the carton or container to make sure your milk, yogurt, or cheese is lowfat or fat-free.

Get 3 cups every day; for kids ages 2 to 8, it's 2 cups

Meat & Beans
Go lean with protein

Eat lean or lowfat meat, chicken, turkey, and fish. Ask for it baked, broiled, or grilled – not fried.

It's nutty, but true. Nuts, seeds, peas, and beans are all great sources of protein, too.

Eat 5 oz. every day

For an 1,800-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov.

Oils Oils are not a food group, but you need some for good health. Get your oils from fish, nuts, and liquid oils such as corn oil, soybean oil, and canola oil.

Find your balance between food and fun

- Move more. Aim for at least 60 minutes everyday, or most days.
- Walk, dance, bike, rollerblade – it all counts. How great is that!

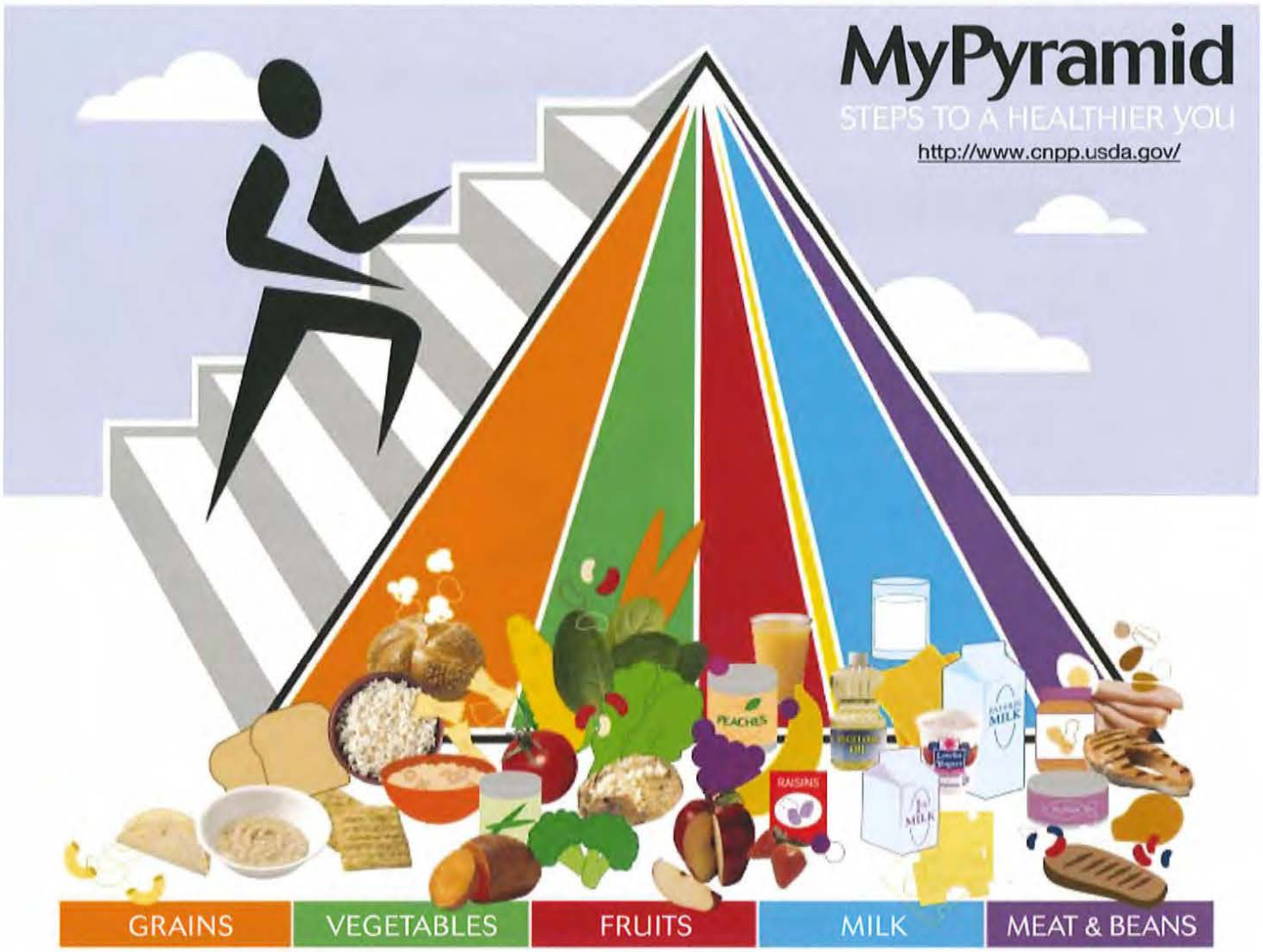
Fats and sugars – know your limits

- Get your fat facts and sugar smarts from the Nutrition Facts label.
- Limit solid fats as well as foods that contain them.
- Choose food and beverages low in added sugars and other caloric sweeteners.

MyPyramid.gov
STEPS TO A HEALTHIER YOU

U.S. Department of Agriculture
Food and Nutrition Service
September 2005
FNS-301

USDA



Make half your grains whole

- Eat at least 3 ounces of whole grain bread, cereal, crackers, rice, or pasta every day.
- Look for "whole" before the grain name on the list of ingredients.

Vary your veggies

- Eat more dark green veggies
- Eat more orange veggies
- Eat more dry beans and peas

Focus on fruits

- Eat a variety of fruit
- Choose fresh, frozen, canned, or dried fruit*
- Go easy on fruit juices

Get your calcium-rich foods

- Go lowfat or fat-free
- If you don't or can't consume milk, choose lactose-free products or other calcium sources

Go lean on protein

- Choose low-fat or lean meats and poultry
- Bake it, broil it, or grill it
- Vary your choices—with more fish, beans, peas, nuts, and seeds

*½ cup of fresh or frozen Maine wild blueberries is equal to 1 serving from the fruit group.

NUTRITIONAL INFORMATION

CARBOHYDRATES

Carbohydrates are sugars, starches, and fibers. They are found in foods made from grains such as bread, pasta, cereal, muffins, and pancakes. They are also found in starchy vegetables such as potatoes, sweet corn, popcorn, peas, and lima beans. Sweet foods and candy contain carbohydrates in the form of sugar. Soft drinks and sweetened drinks also contain carbohydrates. Look for corn syrup and dextrose on food labels, if sugar is not listed. These are two common sweeteners.

Carbohydrates give us energy to run, walk, work, think, and provide for general body operations such as breathing. Whole grain products give us B vitamins. Many foods that contain carbohydrates also give us fiber. Human bodies need fiber to move food efficiently through the digestive system. Unlike grazing animals, humans cannot digest much fiber.

PROTEINS

Proteins are found in both plant and animal products. They are found in meat, milk, dairy products, eggs, beans, peanuts, soybeans, nuts, and in grains such as oats. Animal sources of protein are complete protein while plant sources of protein are incomplete and need to be balanced by combining several plant sources.

Proteins are needed to build muscle, nerves, brain tissue, blood, and bone. Proteins are needed for growth and pregnancy.

VITAMINS

Vitamins are needed in small amounts to keep body systems healthy and working well. Each vitamin has specific functions. For example, vitamin C keeps mucous membranes healthy. Vitamin D is needed to absorb calcium and phosphorous to build and maintain strong bones and teeth.

Vitamins are either water-soluble (dissolve in water) or fat-soluble (dissolve in fat). The water-soluble vitamins are C and the B complex (niacin, riboflavin, thiamin, etc.). The fat-soluble vitamins are A, D, E, and K. Vitamins are found in fresh fruits and vegetables, grains, meat, poultry, fish, eggs, dairy foods, dry beans and nuts. One of the reasons eating a variety of foods is recommended is to get all of the vitamins needed to remain healthy.

MINERALS

Minerals are needed for a wide variety of body structures and functions. Calcium and phosphorus are used to build and maintain strong bones and teeth. They are also needed by the body to transmit nerve signals and release energy from foods. Iron is needed to build red blood cells that carry oxygen. Potassium is vital to keep the heart pumping and for transmitting nerve signals. Sodium and chlorine are needed to transmit nerve signals. They are important in sweating that cools the body, and they keep the blood slightly salty for proper function.

Minerals are found in both plant and animal sources. Calcium and phosphorus are found in dairy products, dark green vegetables, and grains. Sodium and chlorine are in table salt and in processed foods containing added salt. Potassium is found in wild blueberries, melons, and bananas. Seafoods give us iodine. Iodine is needed by the thyroid gland to create the hormones that control growth and metabolism. Iron can be found in liver, beef, spinach, and other dark green vegetables.

FATS AND OILS

Fats and oils are also known as lipids. They provide energy, lubricate joints, are used to create hormones, and are needed to absorb and transport fat-soluble vitamins. Fats and oils give two and a half times the amount of energy as the same amount of carbohydrates. The body stores energy as fat. Fats are found in animal products. Oils and some fats are found in plant products.

Name_____

READING NUTRITION LABELS

Read the nutrition label and answer the questions below.

1. What percentage of the recommended daily allowance of vitamin C does one cup of wild blueberries provide?

2. How much dietary fiber is there in one serving of wild blueberries?

3. List five items that wild blueberries do not contain (zero amounts).

4. What three minerals do wild blueberries provide for your diet?

Nutrition Facts

Serving Size: 5 ounces or 140g (1 cup) of Wild Blueberries

Amount per serving

Calories 60 **Calories from fat** 0

	% Daily Value*
Total Fat 0g	**0%**
Saturated Fat 0 g	
Trans Fat 0 g	
Cholesterol 0 mg	**0%**
Sodium 0 mg	**0%**
Potassium 95 mg	**3%**
Total Carbohydrate 18 g	**6%**
Dietary Fiber 6 g	**25%**
Soluble Fiber 2 g	
Insoluble Fiber 4 g	
Sugars 10 g	
Protein 0 g	

Vitamin A 2% • Vitamin C 4% • Calcium 2% • Iron 4%
Vitamin E 2% • Thiamine 2% • Riboflavin 0% • Niacin 4%
Vitamin B6 2% • Phosphorus 2% • Magnesium 2%
Zinc 8% • Manganese 200%

*Percent Daily Values are based on a 2,000 calorie diet.

5. How many calories are there in a cup of wild blueberries? Where does this energy come from?

Name ANSWER KEY

READING NUTRITION LABELS

Read the nutrition label and answer the questions below.

1. What percentage of the recommended daily allowance of vitamin C does one cup of wild blueberries provide?

   4%

2. How much dietary fiber is there in one serving of wild blueberries?

   6 grams or 25% daily value

3. List six items that wild blueberries do not contain (zero amounts).

   Fat
   Sodium
   Cholesterol
   Riboflavin
   Calories from fat
   Protein

4. What three minerals do wild blueberries provide for your diet?

   Calcium
   Potassium
   Magnesium

Nutrition Facts

Serving Size: 5 ounces or 140g (1 cup) of Wild Blueberries

Amount per serving

Calories 60 **Calories from fat** 0

	% Daily Value*
Total Fat 0g	**0%**
Saturated Fat 0 g	
Trans Fat 0 g	
Cholesterol 0 mg	**0%**
Sodium 0 mg	**0%**
Potassium 95 mg	**3%**
Total Carbohydrate 18 g	**6%**
Dietary Fiber 6 g	**25%**
Soluble Fiber 2 g	
Insoluble Fiber 4 g	
Sugars 10 g	
Protein 0 g	

Vitamin A 2% • Vitamin C 4% • Calcium 2% • Iron 4%
Vitamin E 2% • Thiamine 2% • Riboflavin 0% • Niacin 4%
Vitamin B6 2% • Phosphorus 2% • Magnesium 2%
Zinc 8% • Manganese 200%

*Percent Daily Values are based on a 2,000 calorie diet.

5. How many calories are there in a cup of wild blueberries? Where does this energy come from?

   60 Calories Carbohydrates

Wild Blueberry History and Geography

Brief Description

The students will explore the impact of wild blueberries on the history and culture of several human populations as well as map the geography. An example of civics in action will be addressed in the story of Megan Frank.

Correlations to State of Maine Learning Results: Parameters for Essential Instruction

Content Area	Performance Indicator	Grades 3-5 Descriptor(s)	Grades 6-8 Descriptor(s)
English Language Arts	B1	a, e	a, e
	B3	b	b
	B4	a	a
	B5	a	a
	C1	a, b, c	a, b, c, g
Social Studies	A1	a–e	a–e
	A2	b	b
	A3		
	B1	a	a
	B2	a, c	a
	C2	b	b
	D2	b	b
	E2	b	b

Objectives:

The students will:

1. map the areas of Maine where wild blueberries grow.
2. research and write about the uses of wild blueberries (and other fruits indigenous to North America) by the Native Americans.
3. assume the identity of Megan Frank and write their own letter asking that the wild blueberry be declared Maine's official berry, or create a wild blueberry product as an official symbol for Maine.

Life Skills:

Interpreting information, library skills, mapping, research, writing to persuade

Materials:

- Map of Maine - a state road map that has towns and cities
- Copies of the map of Maine, one per student
- Paper and pens or pencils
- Library references about Native Americans

Estimated Teaching Time:

Three 45-minute class periods, plus time for research

Preparation:

- Make copies of the state of Maine map.
- Obtain and make copies of the materials listed.
- Arrange to visit the library or have reference material available.

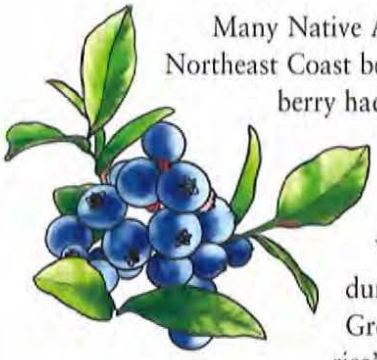
Vocabulary:

As the students conduct their research, make a list of unfamiliar terms and define each.

BACKGROUND

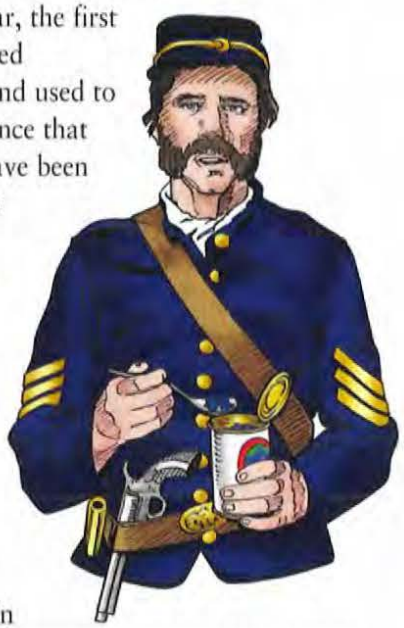
For centuries, wild blueberries have played a role in the lives and traditions of Maine's many different cultures. Native Americans, such as the Passamaquoddy, Penobscot, Abenaki, Micmac, Maliseet, and Wabanaki, used wild blueberries in many ways. In Maine, Native Americans ate fresh wild blueberries late in the summer and preserved them for winter food. They dried the berries whole. These dried berries were crushed and cooked (without sugar) to make little cakes, which they laid on birch bark to dry in the sun. The cakes were stored in birch bark mukoks. Dried blueberries were used as a seasoning for soups and stews. They were also used to cure meat.

A pungent wild blueberry tea was prized for its healing powers. Wild blueberry juice was used as a dye for splint baskets, giving them a lovely reddish-pink color. Blueberry juice and syrup were served as a cough remedy.

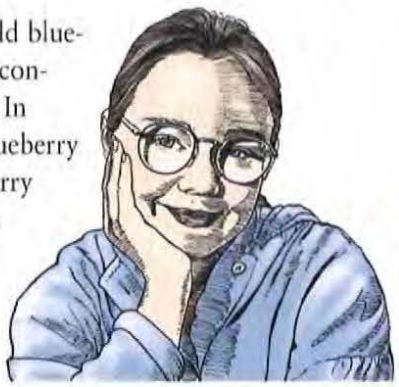


Many Native American tribes along the Northeast Coast believed that the wild blueberry had magical powers. Atop each wild blueberry is the base of its earlier flower in the shape of a five-pointed star. Various legends have it that during a time of starvation, the Great Spirit sent these "star berries" down from the heavens to relieve the hunger of his children.

Centuries before the first settlers came to Maine, the wild blueberry barrens were being burned by the Native Americans to encourage growth of new bushes. When the settlers arrived, the Native Americans showed them how to care for the wild blueberry barrens and taught them the many uses for the wild blueberries. During wild blueberry season, seventeenth century colonial homes served wild blueberry dishes that were titled Grunt, Slump, Buckle, and Fool.



During the Civil War, the first blueberries were harvested commercially, canned, and used to feed the Union Army. Since that time, wild blueberries have been a mainstay of the Maine economy. Generations of school teachers, high school students, families, loggers, and Native Americans return to the barrens every year along with people from all over the world for a working vacation at blueberry harvest time. In addition to independent growers, there are many companies that harvest and process wild blueberries. The oldest dates back to 1874, and the fourth generation is actively involved in the management of the company. The wild blueberry rake is also "still in the family." The rake, first developed in the late 1800s, is unchanged today. The grandson of the original inventor now runs the company that has been manufacturing rakes since 1910. Other companies have made changes to the rake and manufacture different versions.



The impact of the wild blueberry on Maine's culture continues to the present day. In 1990, the Maine wild blueberry was named the official berry of the state, thanks to the efforts of Megan Frank of Manchester, Maine – then a fifth grader. Megan began her efforts in **second grade** by writing a letter to her state legislator suggesting that the Maine wild blueberry be named the official state berry. She first got the idea by hearing in school about the important role wild blueberries have played in the history, economy, and culture of Maine for over 200 years.

INTRODUCTION

1. Ask the students:

   "Where do wild blueberries grow?"
   (While they grow all over the state, this activity concerns mapping the major production areas.)

2. Indicate that today they will find the major production areas in Maine.

ACTIVITY ONE

1. Hand out copies of the map of the state of Maine or, for older students, the regional map that includes the Canadian provinces.

2. Have the students color in the areas where the majority of wild blueberry producers are concentrated. According to the Economic Research Service (ERS) of the United States Department of Agriculture (USDA), the counties that produce wild blueberries are, in order of production: Washington, Hancock, Knox, Waldo, Lincoln, Oxford, Androscoggin, Kennebec, Piscataquis, York, and Cumberland. The areas outside of Maine that produce wild blueberries are Nova Scotia, New Brunswick, Prince Edward Island, Quebec, and Newfoundland.

3. To reflect the fact that wild blueberries do grow all over the state, another color may be used. Color in all other counties as long as the appropriate key is made for each color.

ACTIVITY TWO

1. Present the appropriate information concerning the use of wild blueberries by the Native Americans, settlers, Civil War soldiers, etc.

2. Have the students select one of these Native American groups – Passamaquoddy, Penobscot, Abenaki, Micmac, Maliseet, or Wabanaki – and research its use of this wild fruit and others. If possible, oral histories could be taken. Ask the student to write a report, including the sources of their information.

ACTIVITY THREE

1. Read the section of the supporting information about Megan Frank to the class.

2. Have the students assume the identity of Megan Frank (or a student her age) and write their own letter to their state legislator asking that the wild blueberry become Maine's official berry; or have them use another wild blueberry product that can be made into a symbol. Have the students include reasons why this should be done, based upon the wild blueberry's importance to Maine's history, economy, and culture. Remind them that the purpose of the letter is to persuade. Also, you may want to inform them that fourth grade students in Syracuse, New York, convinced the legislature to adopt a state muffin – the apple muffin – because New York is an apple-producing state.

3. Discuss what they could do if the letter campaign fails *(petitions, news stories, editorials, enlisting others to write, etc.)*.

EXTENSIONS

1. Have the students weave baskets and dye them with crushed wild blueberry juice. (Frozen wild blueberries can be obtained year-round in grocery stores.)

2. Have the students conduct an Internet search to locate other important historical, geographic, or cultural information about wild blueberries.

3. Have the students map the other areas where wild blueberries and cultivated blueberries are grown.

4. Have the students search the Internet to learn if other students have influenced legislation.

EVALUATION

1. Assess the students' written work, quality of research, inclusion of information sources, etc.

2. Assess the students' letters and persuasive ability to accomplish their mission.

3. Quiz the students on where wild blueberries are grown, geographically, in Maine.

Resources

Native American Information

1. Caduto, Michael J., and Joseph Bruchac. *Keepers of the Earth: Native American Stories and Environmental Activities for Children.* Colorado: Fulcrum Printing, 1989.

2. Museums that provide exhibits and information about Native Americans can be found at http://www.mainemuseums.org

Blueberry Information

3. Wild Blueberry Association of North America – http://www.wildblueberries.com

4. Elizabeth White and Historic Whitesbog – http://www.whitesbog.org/whitesboghistory/history1.htm

Maps and Geographic Information

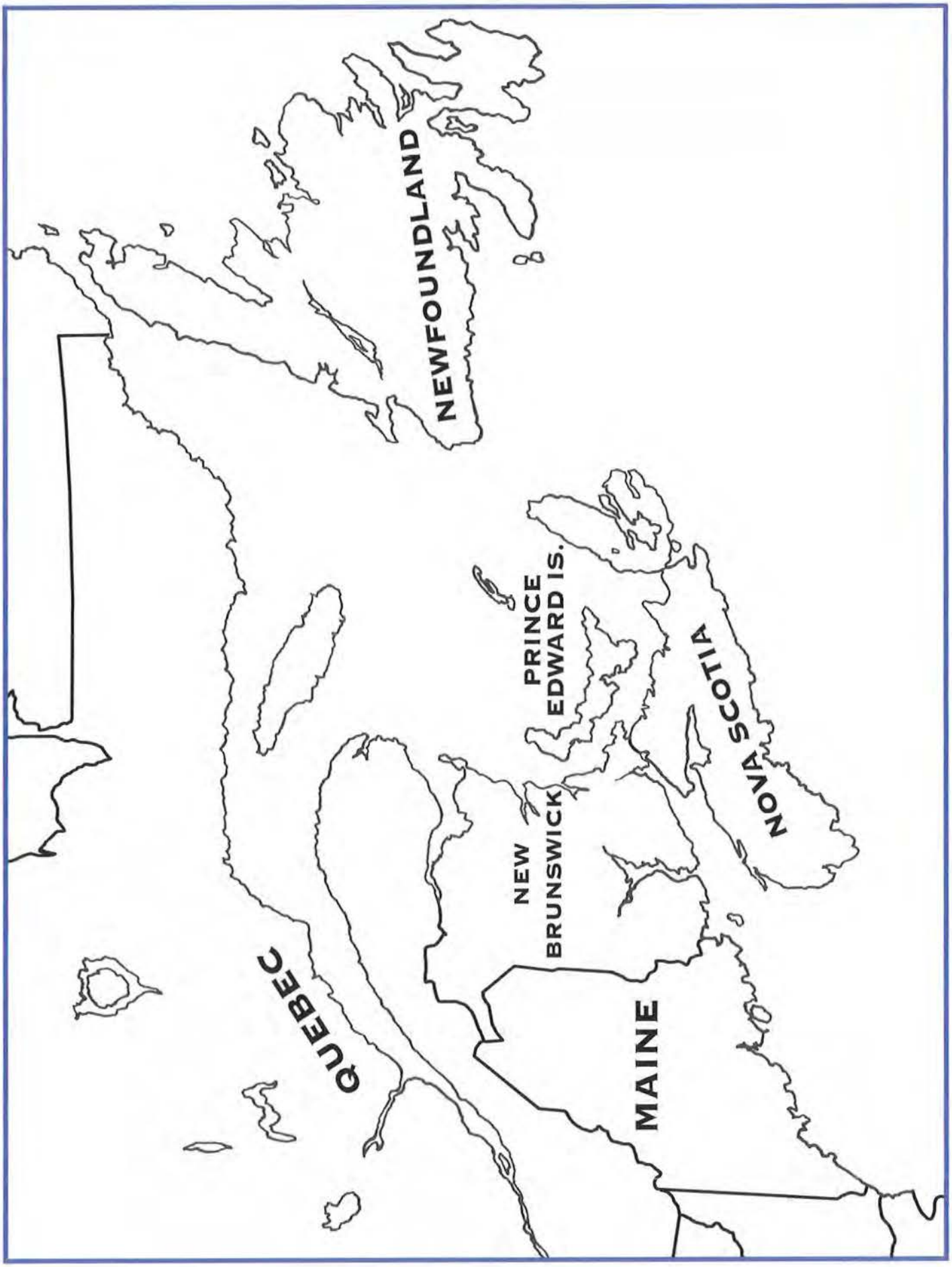
5. Maps of Maine that include county boundaries can be found at http://geology.com/state-map/maine.shtml and http://www.ohwy.com/ME/m/mecounty.htm

6. Teaching Kits and K – 12 Educational Services. Smith Center for Cartographic Education, Osher Map Library. http://www.usm.maine.edu/maps/education.html

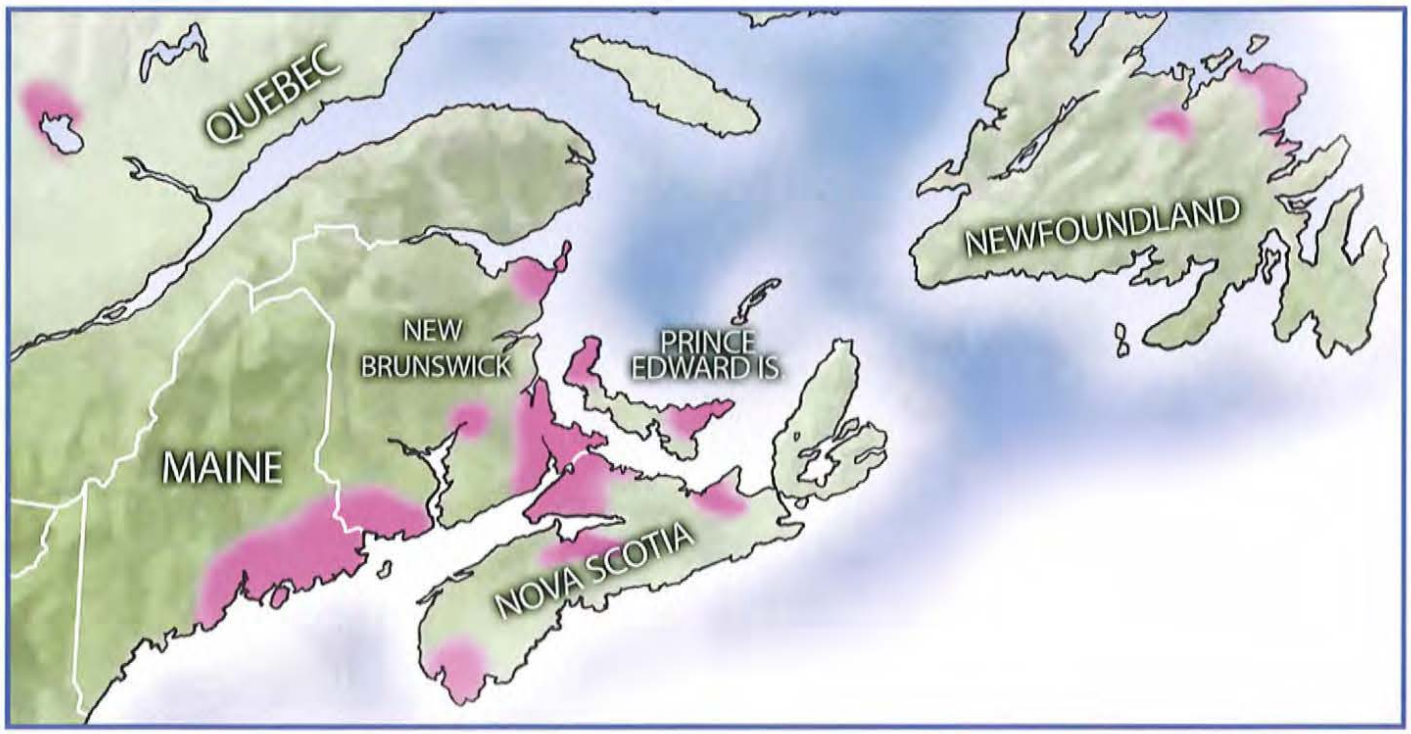
Notes:

MAP OF MAINE


AROOSTOOK
QUEBEC
PISCATAQUIS
NEW BRUNSWICK
SOMERSET
PENOBSCOT
WASHINGTON
FRANKLIN
HANCOCK
WALDO
OXFORD
KENNEBEC
KNOX
LINCOLN
ANDROSCOGGIN
SAGADAHOC
CUMBERLAND
YORK
Penobscot Bay
NORTH ATLANTIC OCEAN
Casco Bay
0
100 Miles
0
100 KM


NEWFOUNDLAND
PRINCE EDWARD IS.
NOVA SCOTIA
NEW BRUNSWICK
QUEBEC
MAINE

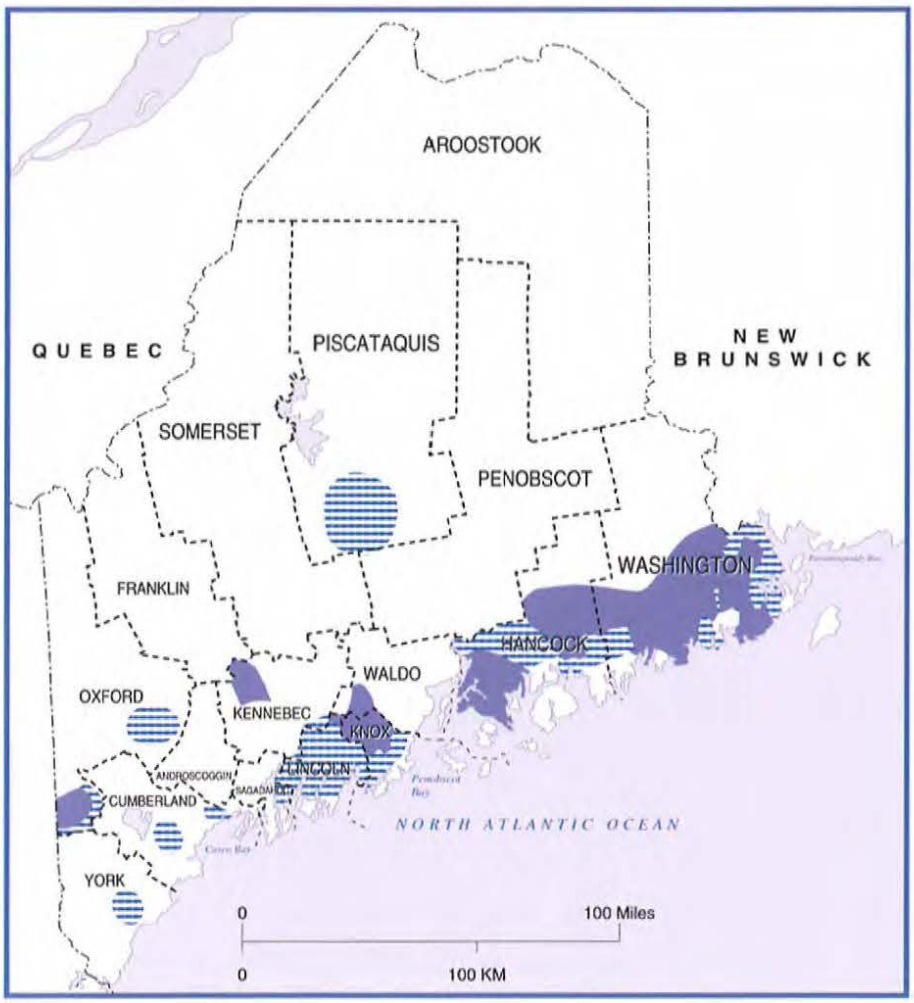
MAP OF WILD BLUEBERRY REGIONS



MAINE DISTRIBUTION OF BLUEBERRY PRODUCTION

Intensive Production

Moderate Production



NOTES:

WILD BLUEBERRY MATH

Burning the fields

Mechanical wild blueberry harvesting

BRIEF DESCRIPTION

The students will examine, interpret and manipulate real-life data about the economics of wild blueberry production.

CORRELATIONS TO STATE OF MAINE LEARNING RESULTS: PARAMETERS FOR ESSENTIAL INSTRUCTION

Content Area	Performance Indicator	Grades 3-5 Descriptor(s)	Grades 6-8 Descriptor(s)
Health Education and Physical Education	A6		
Mathematics	A3 A4 A5 B2		
Social Studies	C1	a, b, c	a, c

OBJECTIVES:

The students will:

1. read and interpret graphs depicting real-world data.
2. create graphs using real-world data.
3. manipulate real-world information to solve problems and understand some of the decision-making challenges of producing wild blueberries.
4. formulate and answer questions from real-world data.

LIFE SKILLS:

Displaying data, graphing, graph reading, mathematics, problem solving

MATERIALS:

- Copies of *Wild Blueberry Production Decisions*
- Copies of *The Annual Blueberry Crop*
- Copies of *Wild Blueberry Production*
- Graph paper
- Pens or pencils
- Calculators, if desired

ESTIMATED TEACHING TIME:

Three 45-minute class periods

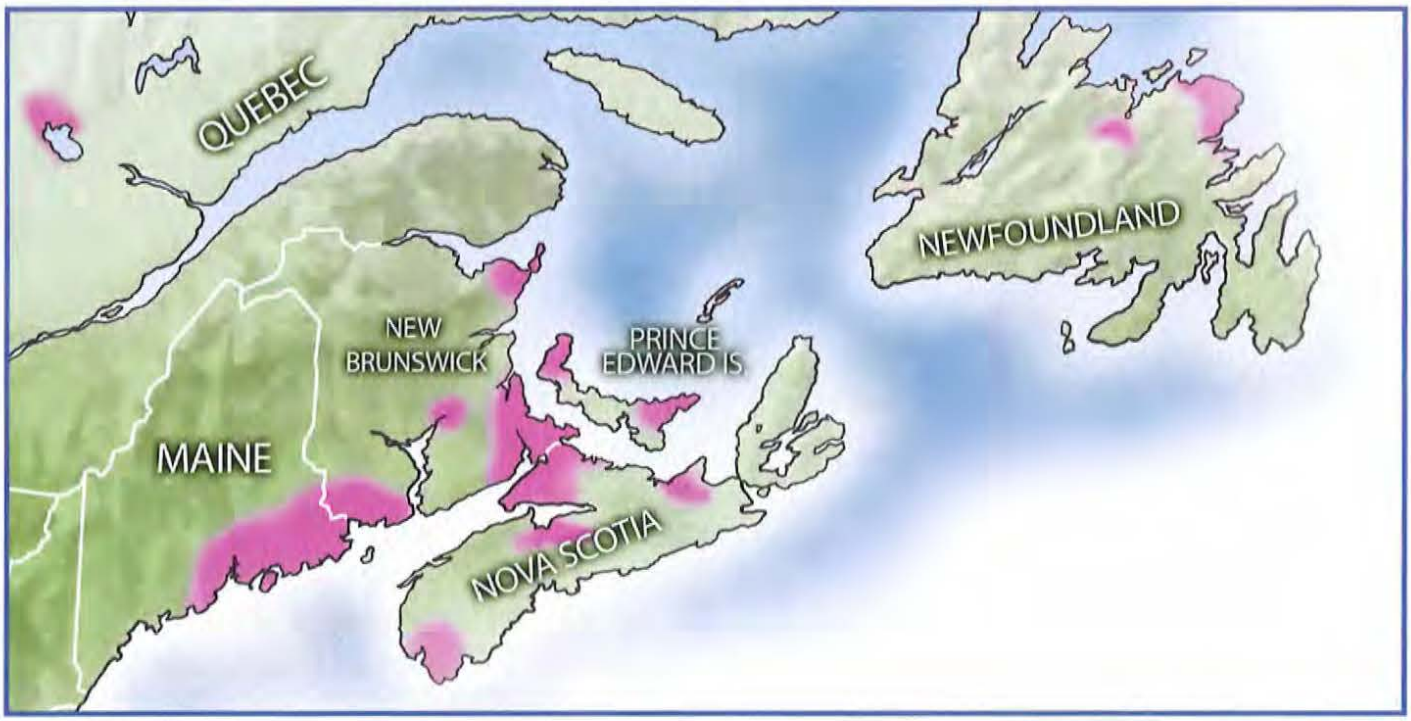
PREPARATION:

Make copies of the student activity pages.

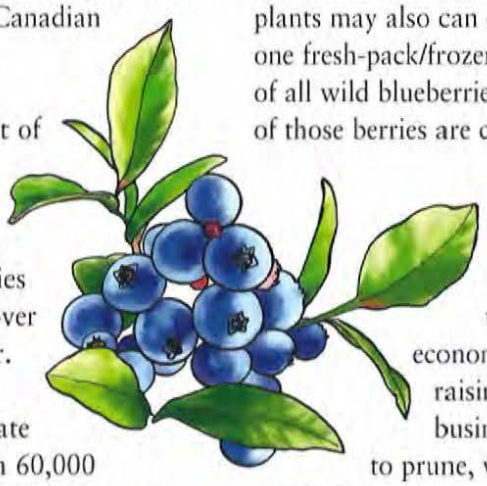
VOCABULARY:

Annual, clone, data, litter, production, pruning, integrated crop management

BACKGROUND



Maine is the largest producer of wild blueberries in the world. Some years, production in Maine has exceeded production of cultivated blueberries in Michigan. Maine produces 13 percent of all blueberries in North America, including wild and cultivated production. Twenty-one percent of the total crop is produced in the Canadian provinces of Nova Scotia, Quebec, New Brunswick, Prince Edward Island and Newfoundland. The remaining 66 percent of the blueberries are cultivated blueberries grown in Michigan, New Jersey, British Columbia, Washington, Oregon, Georgia, Arkansas and other states. Wild blueberries contribute over 250 million dollars and over 2,600 jobs to Maine's economy each year.



Wild blueberries grow all over the state of Maine, but are grown commercially on 60,000 acres. Due to pruning practices, only half of the acreage produces fruit each year. This does not mean that there is a wild blueberry crop every other year. The fields that produce and those that are regrowing are rotated. At any given time, half of the acreage is producing wild blueberries and the other half is regrowing after pruning.

Most of the wild blueberry crop is processed following harvest. Less than one percent of the crop is sold fresh. There are three grower cooperatives that sell wild blueberries to processors. Six companies operate processing plants that freeze blueberries in Maine. These plants may also can or dry wild blueberries. There is also one fresh-pack/frozen cooperative. Currently, 99 percent of all wild blueberries are frozen, but five to ten percent of those berries are canned after harvest.

Each year wild blueberry producers must make decisions about their crop fields. Out of necessity, these decisions are often influenced by economics. If growers cannot make a profit raising their crops, they cannot stay in business. Growers decide how and when to prune, what Integrated Crop Management (ICM) practices to use, how to protect their crops from insects and diseases, when and if to spray crop-protecting chemicals, how much to fertilize and how to market their crops. The following activities demonstrate a few of these growers' decisions. They also depict the importance of Maine's wild blueberry production to Maine's economy and to the worldwide market.

INTRODUCTION

1. Ask the students if they know how important Maine's wild blueberry production is to the state's economy and to the total production of wild blueberries. *(Wild blueberries contributed over 250 million dollars to Maine's economy in 2007.)*

2. Indicate that this lesson will explore that information.

ACTIVITY ONE

FOR OLDER STUDENTS

1. Hand out copies of ***Wild Blueberry Production Decisions*** and have the students complete the activities. If students need a hint for question #4, tell them that they need to divide the square footage needed for one clone into the square footage in an acre. This process needs to be done twice, once at the low end of the range (75 square feet per clone) and once at the high end of the range (250 square feet per clone). This will provide their range of clones per acre.

2. Discuss the decision-making process that a grower must follow for each decision.

ACTIVITY TWO

1. Hand out copies of ***The Annual Blueberry Crop*** and have the students answer the questions.

2. Discuss the importance of Maine's wild blueberry production to the state's economy and to the world's wild blueberry consumers.

3. Introduce the new research concerning the health benefits of wild blueberries. Ask the students to speculate about the impact that this news will have on the demand for Maine wild blueberries. *(Demand is increasing due to these scientific discoveries.)*

ACTIVITY THREE

1. Hand out copies of ***Wild Blueberry Production Decisions*** and have the students complete the activities.

2. Discuss the impact that Maine's production of wild blueberries has on total wild blueberry production and supply.

3. Have the students calculate the annual wild blueberry production of all Canadian provinces and compare it to Maine's. *(As of 2008, 70 million pounds is Maine's annual production average.)*

EXTENSIONS

1. An additional graphing problem that involves multiplying percentages may be used: 99 percent of all wild blueberries are frozen, but five to ten percent of those berries are canned after harvest. Less than one percent of the crop is sold fresh. *(This could be depicted in a split bar graph.)*

2. Find the price per pound that wild blueberry growers are paid by going on the Internet to the New England Agricultural Statistics Service at http://www.nass.usda.gov/Statistics_by_State/ and click on Maine on the map and "Maine Wild Blueberries" under "More State Features" and calculate wild blueberry grower gross revenue per year. Have the students calculate those figures for the past five years and graph the results.

3. Have the students search for the most up-to-date information on the Internet using the Web sites listed or looking at the Maine Department of Agriculture Web site.

EVALUATION

Evaluate the accuracy of questions answered and graphs produced from the activities in this lesson.

RESOURCES

1. United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS), http://www.nass.usda.gov

2. Jasper Wyman & Son of Milbridge, ME, http://www.wymans.com

3. North American Blueberry Council, http://www.blueberry.org

4. Wild Blueberry Association of North America, http://www.wildblueberries.com

5. University of Maine Wild Blueberry site, http://www.wildblueberries.maine.edu

6. Maine Department of Agriculture, http://www.mainefoodandfarms.com

NOTES:

Name_____

WILD BLUEBERRY PRODUCTION DECISIONS

Mowing

Wild blueberry growers need to prune their fields every other year to produce good quality, bountiful crops. Pruning is an essential part of many types of fruit production. Growers can use one of two techniques: burning or mowing. This table gives the cost to prune one acre of wild blueberries using these different techniques. Use this information to complete the instructions below.

Burning

Pruning Techniques	••••• Farm Size in Acres ••••• (Average per acre costs)		
	1 Acre	10 Acres	100 Acres
Burning with Straw	$200	$192.50	$185.80
Burning with Oil	$350	$213.04	$102.60
Flail Mowing	$100	$45.72	$45.07

1. On your own paper, graph the costs for each of these types of pruning techniques. Create a separate graph or separate grouping on the graph for each farm size.

2. It is clearly much less costly to mow than it is to burn. So, why would a producer choose the more costly burning option? Burning can reduce diseases and insect pests that may linger or grow in the litter left from mowing. A disease or insect outbreak may require spraying to prevent crop loss. If it costs the grower an additional $75.00 per acre to spray, which would be the most economical decision for each farm size?

3. In the same scenario as #2, in addition to $75 to spray, the production is reduced, meaning that each acre produces fewer wild blueberries to sell. Therefore, this results in a further loss in income to the grower of $125.00 per acre if burning is not chosen. What is the best pruning option now for each farm size?

4. From one wild blueberry plant, underground rhizomes produce new plants that are identical to the original plant. The parent plant and all of the plants created from its rhizomes are known as a clone. One clone will cover 75 to 250 square feet depending upon age. An acre of land is 43,560 square feet (about the size of a football field). How many different clones might one acre have? Give a range.

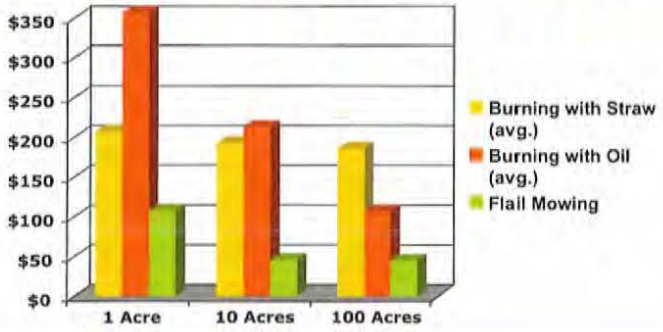
Name *ANSWER KEY*

WILD BLUEBERRY PRODUCTION DECISIONS

Wild blueberry growers need to prune their fields every other year to produce good quality, bountiful crops. Pruning is an essential part of many types of fruit production. Growers can use one of two techniques: burning or mowing. This table gives the cost to prune one, ten, and 100 acres of wild blueberry fields using these different techniques. Use this information to complete the instructions below.

Pruning Techniques	••••• Farm Size in Acres ••••• (Average per acre costs)		
	1 Acre	10 Acres	100 Acres
Burning with Straw	$200	$192.50	$185.80
Burning with Oil	$350	$213.04	$102.60
Flail Mowing	$100	$45.72	$45.07

PRODUCTION FIGURES FOR PRUNING TECHNIQUES CHANGES IN PRODUCTION COSTS



1. On your own paper, graph the costs for each of these types of pruning techniques. Create a separate graph or separate grouping on the graph for each farm size.

2. It is clearly much less costly to mow than it is to burn. So, why would a producer choose the more costly burning option? Burning can reduce diseases and insect pests that may linger or grow in the litter left from mowing. A disease or insect outbreak may require spraying to prevent crop loss. If it costs the grower an additional $75.00 per acre to spray, which would be the best economical decision for each farm size?

   1 Acre – flail mowing
   10 Acres – flail mowing
   100 Acres – burning with oil

3. In the same scenario as #2, in addition to $75 to spray, the production is reduced, meaning that each acre produces fewer wild blueberries to sell. Therefore, this results in a further loss in income to the grower of $125.00 per acre if burning is not chosen. What is the best pruning option now for each farm size?

   1 Acre – burning with straw
   10 Acres – burning with straw
   100 Acres – burning with oil

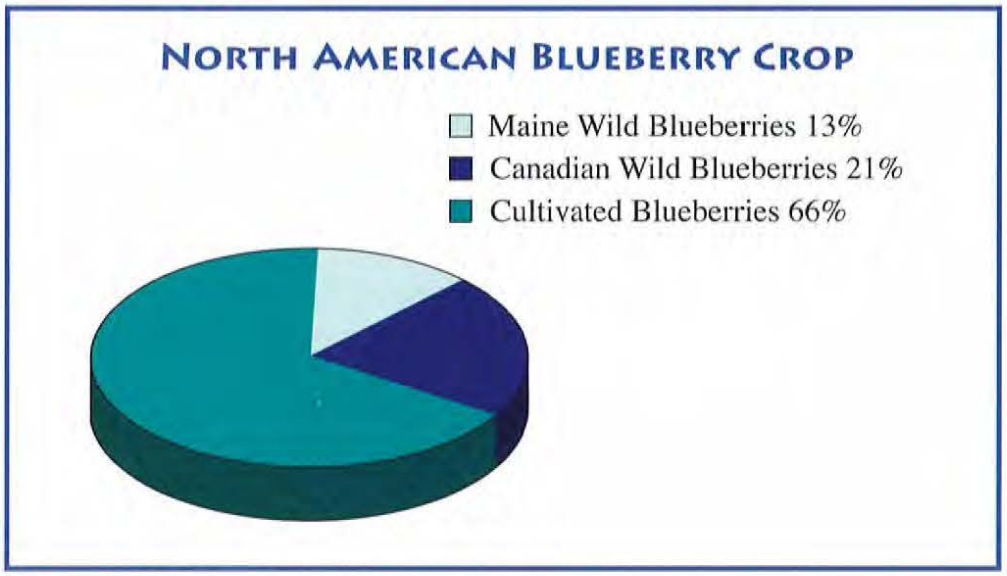
4. From one wild blueberry plant, underground rhizomes produce new plants that are identical to the original plant. The parent plant and all of the plants created from its rhizomes are known as a clone. One clone will cover 75 to 250 square feet depending upon age. An acre of land is 43,560 square feet (about the size of a football field). How many different clones might one acre have? Give a range.

   174 clones to 581 clones

Name_____

THE ANNUAL BLUEBERRY CROP

Read and interpret the information in this graph to answer the questions below.



1. What percent of the North American blueberry crop are cultivated blueberries?

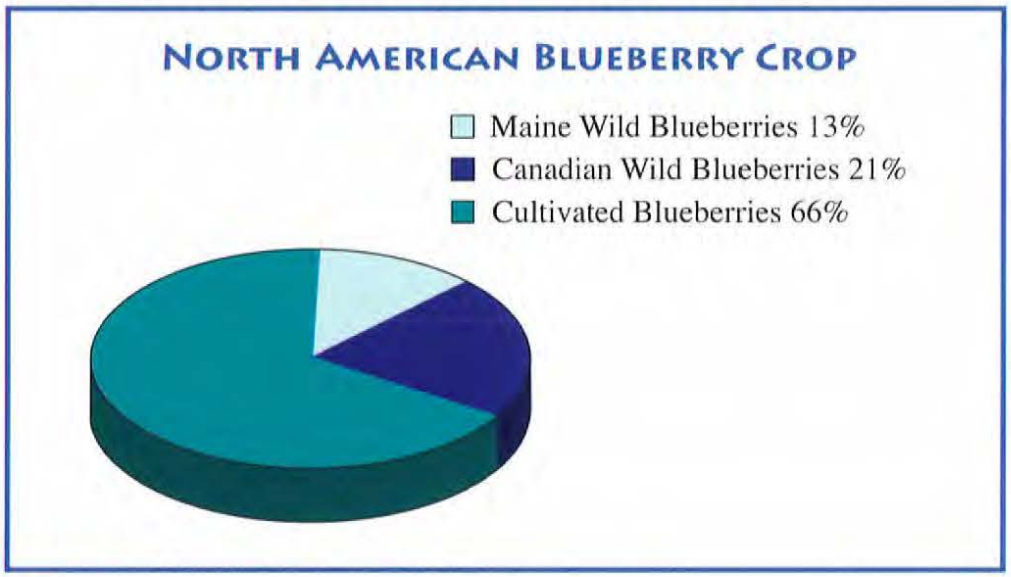
2. What percent of the total North American blueberry crop do the wild blueberries grown in Maine represent?

3. What percent of the total North American blueberry crop do the wild blueberries grown in Canada represent?

Name *ANSWER KEY*

THE ANNUAL BLUEBERRY CROP

Read and interpret the information in this graph to answer the questions below.



1. What percent of the North American blueberry crop are cultivated blueberries?

66%

2. What percent of the total North American blueberry crop do the wild blueberries grown in Maine represent?

13%

3. What percent of the total North American blueberry crop do the wild blueberries grown in Canada represent?

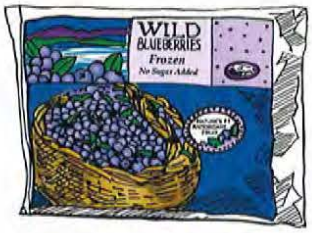
21%

Name_____

WILD BLUEBERRY PRODUCTION AVERAGES

North America

Wild Blueberry Crop	Millions of Pounds
Maine	70
New Brunswick	24
Nova Scotia	34
Newfoundland	1
Prince Edward Island	9
Quebec	55



1. What is the total production of wild blueberries in North America?

2. Graph the data presented in the chart above.

3. How many more pounds of wild blueberries does Maine produce than each Canadian Province?

Name *ANSWER KEY*

WILD BLUEBERRY PRODUCTION AVERAGES

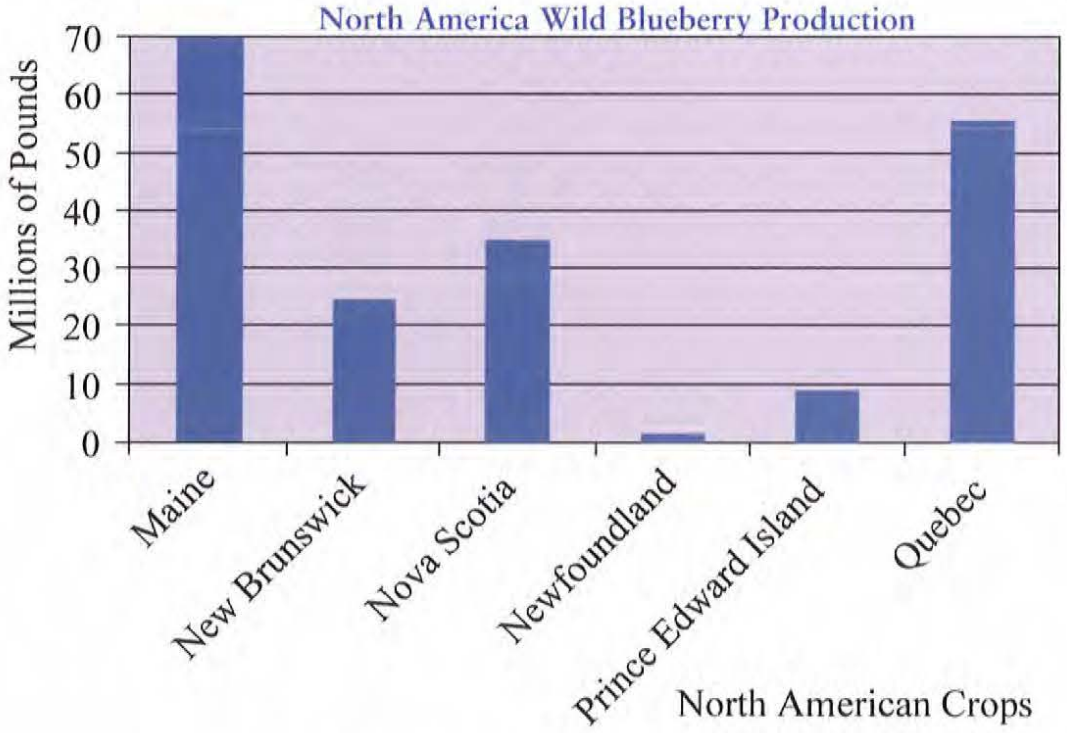
North America

Wild Blueberry Crop	Millions of Pounds
Maine	70
New Brunswick	24
Nova Scotia	34
Newfoundland	1
Prince Edward Island	9
Quebec	55

1. What is the total production of wild blueberries in North America?

193 million pounds

2. Graph the data presented in the chart above.



3. How many more pounds of wild blueberries does Maine produce than each Canadian Province?

New Brunswick - *46 million pounds*
Nova Scotia - *36 million pounds*
Newfoundland - *69 million pounds*
Prince Edward Island - *61 million pounds*
Quebec - *15 million pounds*

WILD BLUEBERRY COMMISSION OF MAINE
FINANCIAL SUMMARY

Period End	Dec-01	Dec 02	Dec 03	Dec 04	Dec 05	Dec 06	Dec 07	Dec 08	Dec 09	Dec 10
Revenue										
Wild Blueberry Tax Rev.	1,211,756	1,391,281	1,031,403	1,330,112	1,032,593	1,239,044	1,275,876	1,459,640	1,471,452	1,346,113
Other Revenue	98,301	45,840	69,195	48,788	94,755	120,480	194,960	189,672	167,628	244,079
Total Revenue	**$1,310,057**	**$1,437,121**	**$1,100,598**	**$1,378,900**	**$1,127,348**	**$1,359,524**	**$1,470,836**	**$1,649,312**	**$1,639,080**	**$1,590,192**
Expenditures										
Promotion	794,150	872,688	672,390	886,187	737,920	771,060	1,025,753	951,604	1,021,293	1,111,543
Research + Technology	57,620	81,650	107,776	176,147	101,927	77,423	89,825	88,617	90,500	84,213
Commission Programs	205,070	48,540	29,895	44,079	28,912	56,368	80,347	57,730	104,856	68,022
Program Grants	5,300	6,000	5,500	6,000	4,500	5,500	9,500	8,000	7,650	7,150
Commission Operations	216,383	146,720	165,837	165,155	177,607	185,892	221,047	312,148	296,034	315,225
Total Expenditures	**$1,278,523**	**$1,155,598**	**$981,398**	**$1,277,568**	**$1,050,866**	**$1,096,243**	**$1,426,472**	**$1,418,099**	**$1,520,333**	**$1,586,153**

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Wild Blueberries

It's the air. It's the ocean. It's the northern nights and sunny days.

It's the soil. It's the rain.

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Wild Blueberries from Downeast Maine and Canada.

Antioxidant Rich. Premium by Nature.

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