A REVIEW OF THE POLICIES AND PROCEDURES OF THE MAINE SEED POTATO BOARD

by

The Commission to Study the State's Seed Farms

Presented to the 115th Maine State Legislature

June 1, 1991

ACKNOWLEDGEMENTS

The Commission wishes to acknowledge the contributions of Dave Hammond, Program Director of the Maine Seed Potato Board; Terry Bourgoin, Peter Mosher and Gary Palmer; all of the Maine Department of Agriculture, Food and Rural Resources; Steve Slack of the New York State Seed Potato Program; and many Maine seed potato producers for their help in the preparation of this report. They all provided us with the information and insights required to understand the nature of the seed potato industry in Maine.

Wallace C. Dunham, Chair
Commission to Study the
State's Seed Farms

Commission Membership

Ned Berce
St. Agatha, ME

Wallace C. Dunham, Chair
University of Maine
Orono, ME

James D. Leiby
University of Maine
Orono, ME

Representative B. Carolyne Mahaney
House of Representatives
Augusta, ME

Michele C. Marra
University of Maine
Orono, ME

Representative Susan Pines
House of Representatives
Augusta, ME

Gregory A. Porter
University of Maine
Orono, ME

Roger Whitney
Corinna, ME

TABLE OF CONTENTS

I. INTRODUCTION AND APPROACH OF THE STUDY

INTRODUCTION

In the Spring of 1991 the Maine State Legislature was seeking a solution to the State's current budget deficit. A part of this effort was to conduct a review of the recipients of State appropriations from the General Fund to see if some savings could be achieved through elimination or substantial reduction of some State subsidies to various interests throughout the State. One of the entities reviewed during this process was the Maine Seed Potato Board (MSPB). During this review, some questions arose as to the level and appropriateness of the State subsidy to the MSPB and the MSPB's current financial situation.

To seek some answers to the questions that arose, the 115th Legislature established a Commission to study the MSPB's history, functions and responsibilities and to make recommendations for improving the efficiency and effectiveness of the State seed farms, the Porter Farm and the Homestead Farm, which are operated by the MSPB to carry out its legislative mandate. The implementing legislation for the study directed the Dean of the College of Applied Sciences and Agriculture at the University of Maine to serve as the Commission Chair and to appoint Commission members representing the seed potato industry and various fields of expertise relevant to the study.

The Study Commission first met in March of 1991. Since that time, the Commission has toured the facilities at the Porter Farm in Masardis, Maine, interviewed extensively the MSPB's Program Director in Masardis, and met with representatives of the MSPB, the Maine Potato Board, the Bureau of Agricultural Production of the Maine

Department of Agriculture, Food and Rural Resources, the Director of the Uihlein State Seed Farm in New York State, a number of individual seed potato producers, representatives of the University of Maine Cooperative Extension Service, and other interested parties to discuss various aspects of the study. In addition, many involved in the operation of state or provincial seed potato farms elsewhere were contacted. Many of these groups supplied helpful information, and all of them supplied useful and insightful suggestions to the Commission. In addition, the Commission has met several times to review the progress of the study and to deliberate on its findings and recommendations. The report that follows is the result of the Commission's research and deliberations.

APPROACH OF THE STUDY

The Commission has taken the approach that the most useful information that can be provided at this time is a description of the various broad policy options for improvement of the MSPB's efficiency and effectiveness and the advantages and disadvantages of each. The Commission did not have available to it the detailed information required to attempt to provide "micro-management" suggestions for improving the financial picture of the MSPB. Once a future policy direction and subsidy level have been decided, the managers of the MSPB will be in a better position to obtain appropriate information and make decisions at that level of detail. The following sections of the report present discussions of several of the most important problems of the MSPB and its seed farms and some possible paths to a solution of these problems as the Commission sees them, along with a discussion of the pro's and con's of each. A

summary list of the Commission's recommendations appears in the final section of this report. The Commission has attempted to view the consequences of its recommendations from the perspective of both the State and the Maine seed potato industry in the short term as well as in the longer run.

II HISTORY AND CURRENT STRUCTURE OF THE MAINE SEED POTATO BOARD

THE SEED POTATO BOARD AND PORTER FARM

The Maine Seed Potato Board (MSPB) was organized in April, 1945. Its mandate is to produce, or cause to be produced through contract or otherwise, such acreage of foundation seed potatoes of various varieties as it deems necessary for distribution and sale to potato growers in Maine. Thus, MSPB is the organization in Maine responsible for ensuring that an adequate supply of high quality, disease free seed potatoes are available to meet the needs of the state's commercial seed potato producers and, ultimately, the entire Maine potato industry. Successfully meeting these needs is critical given the susceptibility of potatoes to many viral, bacterial, and fungal diseases and the importance of the Maine potato industry to the state economy.

Formation of the MSPB was primarily driven by a need for production of starting potato seed stocks that would be free from bacterial ring rot, a devastating disease that was present in the majority of commercial potato seed at that time. The duties of the MSPB were to select foundation seed growers, make necessary regulations for seed propagation, and select the technical personnel needed to guide the seed multiplication program. The MSPB worked closely with the Maine Agricultural Experiment Station (MAES) in that MAES scientists carefully selected tubers and developed small, greenhouse-grown seed lots which were known to be free from ring rot and viruses. MAES scientists then supplied those seed lots to the MSPB for increase as foundation seed stocks. Initially, foundation seed was grown in isolated areas by private

growers under contract to the Board. In 1947, the MSPB decided to purchase a farm in the Aroostook County town of Masardis, enabling it to better control and supervise the production of foundation seed stocks. The Bean & Allen Farm was purchased for $40,000 to meet this need because of its isolation from large tracts of commercial potatoes and its history of foundation seed production. Seed stocks were produced on approximately 95 acres of the farm during the late 1940's and early 1950's. Most of the production consisted of eight commercially important varieties (mostly the Katahdin and Kennebec varieties) with about five acres reserved for minor varieties and new seedlings. Initial problems with the farming operation centered around the stony nature of the farm's soil, the need for updated equipment, and maintenance of seed lots which were free from potato spindle tuber viroid (PSTV). The farm was renamed "Porter Farm" in 1960 to honor Mr. Wesley F. Porter, the program director of the MSPB and farm manager from its beginning until his retirement in 1957.

The MSPB was initially funded and organized in April 1945 by the 92'nd Legislature which appropriated a 10-year $100,000 loan to facilitate initial operation of the MSPB. An additional $15,000 was borrowed in 1949. An additional loan of $35,000 was later provided to partially fund a new potato storage. The 97'th Legislature in 1955 extended the period of the original loan for an additional 10 years so that it became due in 1966. These loans were repaid beginning in March 1950 until they were completely repaid in May 1965.

Since 1981, the MSPB has received a yearly appropriation from the Maine Legislature. This support plus successful grant awards have allowed the MSPB to

upgrade facilities at Porter Farm. This improvement has included the establishment and expansion of tissue culture and greenhouse facilities for the production of high quality, vigorous, disease free pre-nuclear seed stocks. Tissue culture allows propagation of seed potatoes using methods that interrupt the normal tuber to tuber production cycle. This interruption increases the rate of seed stock multiplication and reduces the risk of disease introduction. Farm facilities now include a large tissue culture laboratory complex, a pathogen testing laboratory, two greenhouses, controlled environment potato storages, and two irrigation systems.

The current objectives of the MSPB are as follows:

1. To produce a sufficient quantity of the appropriate seed potato varieties for Maine's seed industry.

2. To carry out a post-harvest testing program to assess the disease content of Maine seed potatoes.

3. To produce a sufficient quantity of new and experimental varieties for testing and evaluation in the northeastern United States.

4. To carry out its programs within the constraints of its budget.

The ultimate populations served by the MSPB are the Maine seed potato industry and the overall Maine potato industry, since the entire industry is dependent on a reliable supply of top quality, high yielding seed potatoes. Given the importance of the Maine potato industry to the State economy, especially in Aroostook County, the MSPB serves the citizens of the State at large, as well.

THE POST-HARVEST FLORIDA TEST

Essentially all potato seed certification agencies conduct a winter post-harvest test to assure quality of their seed lots. The post-harvest testing of Maine's seed potatoes is conducted by the MSPB on its 92 acre farm in Homestead, Florida. Growers must enter samples from all fields and seedlots which are potentially intended for seed use. The samples are treated in October to break dormancy and then transported to Florida. Planting is completed by mid to late November and disease inspections occur in January using MSPB personnel and several certified seed inspectors. Results of the test are available in January and provide information on the disease content of each seed lot of Maine potatoes.

Maine's Florida Test was initiated in 1938 and was a function of MAES until 1958. The test became a function of the MSPB at that time. During 1990-91, the MSPB tested 878,000 tubers at the Homestead site. Approximately 32% of seed lots contained virus levels high enough for them to be disqualified as nuclear or foundation seed. Of these virus containing seed lots, most qualified as certified seed, while 5% of the seed lots were rejected from the certification program.

OPERATION OF THE MAINE SEED POTATO INDUSTRY

Seed potato producers in Maine purchase "nuclear" seed potatoes from the MSPB or other comparable sources and increase the nuclear seed through several field seasons. This initial seed stock is termed "nuclear" because it comprises the basis or nucleus of Maine's entire seed potato industry. Nuclear seed lots comprise the high quality basis of the industry's foundation and certified seed generations. It is these latter generations

that comprise the bulk of seed that is sold to non-seed growers in Maine and other markets. All seed potato growers must participate in the MSPB's post-harvest test program (the winter Florida test) to assess the disease content of the seed stocks. The present cost to the grower is $60 per sample. All seed lots in Maine must successfully pass the post-harvest Florida test to be sold as seed. Requirements for the Florida test differ among nuclear, foundation, and certified seed classes.

Seed potato industries across North America have adopted numerous systems for documenting the number of field increases that have taken place since a seed lot was "cleaned up" via tissue culture and propagation in sterile media. The numbering systems are not standardized across states and provinces; however, the general intent of all systems is to document the relative age of seed lots. Maine's system for identifying the age of seed lots begins with pre-nuclear seed which is produced in sterilized soil in greenhouses. Pre-nuclear seed consists of plantlets or minitubers produced from plant material that is multiplied and freed from viral pathogens using tissue culture. Production of high quality, pre-nuclear seed is highly technical and requires trained personnel and strict quality control. It is the most expensive step in seed potato propagation.

In Maine, when pre-nuclear seed is planted in the field, the resulting crop of tubers is designated Nuclear 1 (N1). Pre-nuclear plantings must be extensively tested for foliar disease content at a cost of approximately $1200 per acre. When N1 seed is planted in the field the resulting tubers are designated as Nuclear 2 (N2). When N2 seed is planted the resulting tubers are designated as Nuclear 3 (N3), and N3 seed results in

tubers designated as Nuclear 4 (N4). Nuclear seed must pass the most rigorous Florida test in the industry. Each test sample must consist of 400 tubers, representing no more than 3 acres. Only seed lots which have less than 0.5% total virus (mosaics and leafroll) with no potato spindle tuber viroid (PSTV) qualify for nuclear designation. Until recently, most seed sold from the Porter Farm was designated as N4. Recent policies of the MSPB and changes of demand by the industry have caused a shift toward N3 and N2 sales. Seed requests to Porter Farm for the 1992 crop, as of March 1991 were for 11,719 cwt. of N3 seed and 3,526 cwt. of N2 seed.

When N4 seed is planted in the field the resulting tubers are designated as Generation 1 (G1). When G1 seed is planted the resulting tubers are designated as Generation 2 (G2). Field increases can occur in this manner up through Generation 5 (G5). Maine has adopted a limited generation (flush-out) program which limits seed propagation to 5 generations after leaving Porter Farm or an equivalent program. This requires that Maine seed growers constantly update their source of seed in order to provide vigorous, disease-free seed potatoes. The MSPB has recently proposed to limit the generation seed classes to G3 by 1993, thus imposing stricter generation limits.

G1 through G5 seed can be either Foundation class or Certified class seed depending on the levels of virus diseases detected in field inspections and the post-harvest Florida test. Each test sample for Foundation seed must consist of 400 tubers, representing no more than 15 acres. Only seed lots which have 0.5% or less total virus (mosaics and leafroll) and no PSTV qualify for the Foundation designation. Each test sample for Certified seed must consist of 400 tubers, representing no more than 40 acres.

Only seed lots which have 5% or less total virus (mosaics and leafroll) and 0.25% or less PSTV qualify as Certified Seed. Scientists and growers agree that earlier generation seed lots usually are lower in disease content (including virus, fungal and bacterial pathogens which typically infect potato seed lots during field propagation) and more productive. Because of the above observations, seed lots which are recently derived from tissue culture (early generation) are considered to be higher in quality than those that have been increased through numerous field plantings.

MAINE SEED POTATO BOARD COMPOSITION

At its inception, the MSPB consisted of the Commissioner of Agriculture, who served as the Board's chair, and six members that were appointed by the governor, from specified areas of the state. Each appointed member served a three-year term. Over the years, changes have been made regarding the mandated composition of the Board. There are now eight appointed members in addition to the Commissioner of Agriculture and these members elect their chair. One appointed member must be primarily a tablestock producer and another must be primarily a processing grower. The Commissioner of Agriculture is now given the authority of appointing MSPB members and these members may serve up to two consecutive three-year terms. The MSPB annually elects a secretary that is not necessarily a member. The secretary has traditionally been the Director of the Division of Plant Industry within the Maine Department of Agriculture, Food, and Rural Resources.

III. HISTORY OF THE PROBLEM

The problem facing the MSPB is that in many recent years costs have exceeded revenues. The average annual deficit over the past six years is more than $32,000. Moreover, it is likely that, if the MSPB organization, cost structure, pricing structure and subsidy level remain as they are, the operating deficit will persist. The problem is further compounded by the fiscal crisis currently faced by the state, where nearly every other state agency is facing a reduced level of basic support, at least in real terms.

Table 1 summarizes the extent of the recent operating deficits. In some years, the Board has been able to cover the deficit with carryover from previous years, but the legislature occasionally has been asked to provide extra funding at the end of a fiscal year.

Table 1. Financial Summary of the MSPB by Year

	Fiscal Year					
	85	86	87	88	89	90
	----------$,000's----------					
Revenues	747	881	890	967	1,096	1,010
(% Change)		+17.9	+1.0	+8.7	+13.3	-7.8
Expenditures	886	965	863	887	1,161	1,026
(% Change)		+8.9	10.6	+2.8	+30.9	-11.6
Gain (Loss)	(138)	(84)	27	79	(64)	(16)
Five Year Averages (FY86-FY90)						
Revenue Growth		+6.62%				
Expenditure Growth		+4.08%				
Operating Deficit		$32,670				

Given the MSPB's current system of record keeping, it is difficult to pinpoint the sources of the operating deficits. It is likely that they have been partly due to the many technological improvements made at the Porter Farm over the past decade during the shift to laboratory tissue culture for seed propagation. The laboratory and greenhouse improvements, as well as the additional skilled staff required, have been expensive, but as discussed elsewhere in this report, these advances have benefitted the Maine seed potato industry and were necessary if the industry is to remain competitive. Other farm staffing has not been reduced in the process, resulting in a relatively large and increasing portion of the farm budget in salaries and benefits. Other, non-labor production costs have likely increased in real terms, as well. Pricing of the MSPB's products and services has not fully reflected these cost increases, nor have the cost-cutting measures instituted by the MSPB been able to solve the problem. A summary of these measures appears in the "Review of Agricultural Boards and Commissions" of the Joint Standing Committee on Audit and Program Review, 1990-1991 and is reproduced in the box below.

As can be seen in Table 1, adoption of some of these measures helped to achieve a deficit reduction of almost $40,000 in FY90 relative to the previous year. The projected deficit for FY91, however, is estimated to be as high as $90,000, depending upon the fate of the contracted 7% salary increase for state employees. Recommendations 4, 5 and 6 concerning contracting, the reduction of the number of varieties and the annual planted acreage have not yet been implemented fully.

It appears that, although the Board has been able to reduce costs in some areas, there has been some retreat from the cost-cutting measures instituted in FY90. For

COST CONTAINMENT MEASURES

1. Transferred the Foundation Roguing Program to the Seed Potato Certification Program. Estimated Savings: $3-5,000. This action also freed one staff member from supervising the program so that he could spend more time at the Porter Farm, reducing the need for overtime among other staff members.

2. Increased the price of seed from Porter Farm from $22 to $24 per cwt. Estimated increase in revenue - $32,000.

3. Increased the Florida Test fees from $55 per sample to $60-70 per sample, depending on the class of seed to be evaluated. Estimated increase in revenues - $15,000.

4. Required pre-contracting of all varieties with sales of less than 100 cwt. and prohibit the production of varieties for which there is a demand of less than 50 cwt.

5. Reduced the number of varieties produced at the Porter Farm from 96 to 60, reducing the labor needed to clean and disinfect crop handling equipment between varieties.

6. Reduced the acreage produced at the Porter Farm from 103 to 94. Estimated savings in fertilizer and chemicals - $3,000. Also reduced the labor needed to plant, rogue, cultivate, and harvest the crop.

7. Authorized the Program Director to purchase various pieces of equipment, e.g. 2,000 feet of irrigation pipe, a used traveling irrigation unit, new pressure-washing equipment, etc., which were reported to reduce labor costs.

8. Sold Nuclear 3 seed from the Porter Farm at a premium over Nuclear 4 seed, given sufficient availability.

example, the number of potato varieties grown on the Porter Farm in FY91 approaches pre-FY90 levels (see Appendix A). Planted acreage in FY92 is again expected to be more than 100 acres. The staffing levels and hours worked also appear not to have

changed appreciably, despite the reorganization and investments in labor-saving equipment designed to reduce them.

Another serious problem facing the Board in the near future is that of capital replacement. The Porter Farm operation, in particular, has been "living off of its depreciation" for a number of years. That is, there has not been a reserve built up over the years to replace machinery, equipment and structures as they wear out. Many of the farm implements are now quite old, no major replacement equipment has been purchased within the past six years, and some equipment will soon need to be replaced if farm production is to remain at or near current levels. Within the next five years at current production levels, the farm could require a replacement tractor and harvester and a new packing line, as well as refurbishment of one of the greenhouses. Although the short term expense of these replacements could be in the range of approximately $150-200 thousand, the repair, maintenance costs and extra labor costs associated with the current old equipment will probably exceed the replacement costs in the long-run. Under current cost constraints these replacements are not likely to be possible since the purchase price of one new tractor can equal or exceed the current level of operating deficit. If production levels are reduced substantially over the next five years, the capital requirements of the Farm will not be as great, although some level of capital replacement will be necessary. Also, as new technology becomes available, a capital reserve will allow the MSPB to update its procedures for producing tissue culture materials and laboratory disease testing with little disruption to its normal operating budget.

IV. THE ECONOMIC RATIONALE FOR THE MAINE SEED POTATO BOARD AND STATE SUBSIDIZATION

ECONOMIC JUSTIFICATION OF THE FUNCTIONS OF THE MAINE SEED POTATO BOARD

The purpose of this section is to provide some of the economic reasons for why the public provision of the goods and services supplied by the Maine Seed Potato Board is appropriate. Because of the limited time available to this study, we are unable to provide great detail or specific analysis of these justifications and focus entirely on standard economic rationale for the public provision of goods.

The public provision of a good is economically appropriate if private markets fail to allocate socially desirable levels of the good. Private market failures result any time that all of the costs or benefits associated with the provision or use of the good will not naturally be fully paid by buyers and sellers. In such instances, either too much or too little of a good will be produced to provide the maximum benefit to society. Two common causes of market failures are known as externalities and economies of size (also known as natural monopolies), both of which appear to be present in the Maine seed potato industry.

Externalities

Externalities are effects of the production or use of a good that are felt by individuals other than the buyers or sellers of that good. Positive externalities result when the production or use of a good causes benefits to those not directly involved with the good. If positive externalities exist, too little of a good will be produced by the

private sector alone. Negative externalities are cases where some of the costs of an activity are experienced by others than those directly involved with the good. The research, disease protection, and genetic diversity functions of the MSPB act as corrections of externalities market failures.

Disease in the potatoes of a single producer may potentially have very wide spread effects, particularly in the case of seed potatoes. The incidence of some diseases can make an entire crop fail or become unsalable. In the case of seed, such infection can be spread to many farms at diverse locations and very quickly affect an entire industry. The Porter Seed Farm was founded as the result of just such a scenario.

Potato seed producers have strong incentives to maintain a reputation for high quality seed. There are significant premiums for producers whose seed is regarded as having low disease levels, as well as other quality characteristics. However, it is difficult to detect many potato diseases at early stages and it is almost impossible to determine the initial source of such diseases. As a result the quality premium available to seed producers is likely to be inadequate to provide sufficient incentives to maintain the disease free quality of their product.

Further, seed buyers also have incentives to protect their own operation from disease and are willing to invest some resources in such protection. A difficulty arises from the fact that potato producers have less incentives to protect their neighbors. Should one individual decide to bear more risk of disease in order to reduce costs, that person also places his or her neighbors at risk with no compensation to them for bearing the additional, unwanted risk. Thus, a single individual has too little incentive to protect

his or her neighbors from the risk of disease. As such, there will be too little disease protection provided. Because all individuals have similar incentives to balance risk and return, all will tend to entertain more risk because they will not have to bear the full cost of such risk. The result is that, if corrections are not made, the incidence of plant disease increases to the detriment of the entire industry.

Both sources of economic externalities may be reduced by the intermediation of the public sector in the provision of protection of some form. The appropriate form varies from situation to situation but necessarily involves some public control of the market. In the case of the seed potato industry in the United States, this control is commonly a combination of the production of early generation, low disease seed stock and grading and inspection of later generation seed. This is the primary reason for the public provision of the Porter Farm and the Seed Certification program. Because of the clear incentives of the private sector to under invest in such activities, it is appropriate for the public sector to provide some subsidy to this activity.

There are two additional sources of economic externalities associated with the Maine Seed Potato Board. These are the research functions of the Board and the provision of an array of varieties of seed potatoes. These are discussed in turn below.

It is a well known phenomenon that many of the economic returns to research cannot be recaptured efficiently in the prices of products. The primary reasons for this are that, once in the market, many processes can be easily imitated by firms that do not have to bear all of the costs of the initial research. That is, some of the benefits of the research are external to the individual generating the research results. Because of this

phenomenon, patents and copyrights have been parts of American law since before independence. For tangible products, patents and copyrights may be adequate protection. However, many kinds of research results cannot be protected in this way and the externalities persist. There is a great deal of evidence that this is true of many forms of agricultural research. In particular, many estimates of the economic returns to agricultural research are orders of magnitude higher than the returns normally expected for investments made by the private sector.[1] If such returns could be internalized by private firms, they would be expected to engage in a much greater amount of such research and drive the rates of return down to levels common to those of private industry. Without public intervention and subsidies, too little research would be performed for the general public interest.

The provision of genetic variety is yet another activity of the Maine Seed Potato Board with significant external effects. There is a long history of crop and population failures that are the result of too little genetic variation. It is the natural economic tendency of private firms to focus on only a few of the most profitable varieties of potatoes. Here again, the returns to a single producer are generally too low to provide incentives to provide for an adequate genetic variety for the overall protection of the industry. Without a ready supply of new genetic material, it could take many years for the potato industry to recover from the kinds of industry disasters that have been experienced by other agriculture sectors (there have been major crop disasters in cotton,

---

[1] See Leiby and Adams (*Northeastern Journal of Agricultural and Resource Economics*, Spring, 1991) provides both a review of this issue and estimates of these returns in Maine.

corn and other agricultural industries as a result of genetic concentration). Thus, an important function of the Board is to provide more genetic diversity than would normally be provided by the private sector.

Economies of Size

Economies of size market failures occur if there are fixed costs associated with the production of a product that are great enough that only one producer can efficiently supply an entire market with the good. If this occurs, too little of the good will be produced, most likely at too high a price. It is very likely that this is the case, at least through some phases of the production of nuclear quality seed stock.

Because of the rapid increase of seed stock during a single generation (approximately 10 to 1), it is possible that a single firm or agency could easily provide the entire early generation seed stock for a very large industry. For example, a single acre of seed could be increased sufficiently to supply seed to the entire Maine potato industry in six years. The possibility of such concentration at the early stages of production would not normally lead to a monopolized market since without the concern for disease any producer could produce a substitute product were there an attempt to monopolize the market. However, because the tissue culture technology required to produce disease free early generations requires technical expertise and specialized equipment that would imply high per unit costs for low levels of production, an economies of size market failure exists. In this case a single producer would be able to produce early generations at a lower cost than many smaller operations, thus a natural monopoly of the early generation seed market would evolve. Since, up to a point, such a monopoly would have incentives

to produce less than the optimal quantity of early generation seed, at a price higher than the cost to produce it, the Maine potato industry would decline as a result of higher costs of high quality seed. In cases such as this, it is common for public agencies to either regulate or completely control the provision of the goods or services involved. Further detail about this phenomenon can be found in any intermediate level economics text.

It is also the case that an industry subject to economies of size cannot produce a socially optimal quantity of its product and recover its costs from the consumers of the product. This is because at the optimal quantity, the average costs of production are necessarily greater than buyers would be willing to pay.

The tissue culture enterprise of the MSPB is clearly subject to the economies of size such as those described above. If the full cost of the tissue culture were to be reflected in the prices charged to growers (either directly, through price, or indirectly, through a tax or assessment) too little of the products of the tissue culture would be purchased by growers. This would result in either a decline of the potato industry or the substitution of less reliable seed stock. This would constitute a loss to the general economy of Maine, not just the potato industry, and thus implies that it is in the interest of the general populous of Maine to contribute some resources to this enterprise.

Because of the existence of the economic market failures described in this section, it is valuable to the general economy of Maine and particularly the potato industry that many of the functions be provided by the public sector. The functions of the Maine Seed Potato Board discussed above, including assurance of low disease seed stock, research, the provision of genetic diversity, and protection from monopolization are all naturally

combined in an agency like the Board although some alternate structure might be possible. It is very clear that some level of subsidization of these activities is in the interest of the State economy.

Public investment in the MSPB in the past has, in part, been responsible for the recent success of the Maine seed potato industry. Maine seed is reputed to be of high quality and is in demand, particularly in the Eastern markets. Figure 1 presents one measure of the success of the Maine seed industry over the past decade. The market share of Maine seed in the states east of the Mississippi has increased by 50% in the past decade. This gain in market share and an increase in Maine seed shipments has occurred even as the total planted acreage in these states has declined. This success has been due partly to improved seed storage, also a subject of public investment through the Potato Marketing Improvement Fund, and through the efforts of the seed growers, themselves, but, in large part, can be attributed to the improvements made by the MSPB and its Program Director.

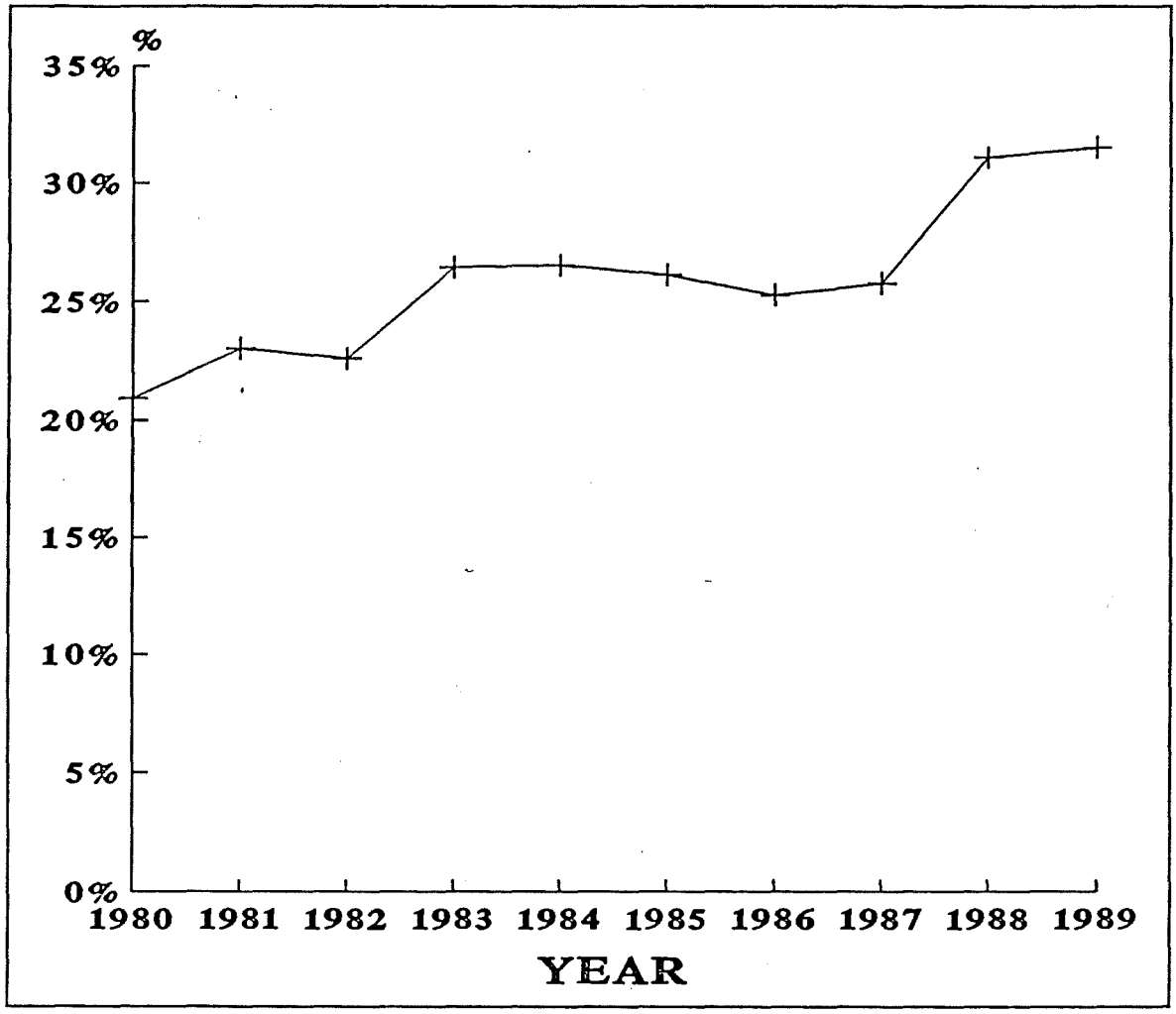

Figure 1: Maine's Share of Eastern U.S. Seed Markets Over Time

Sources: USDA Market News Service, Presque Isle, ME and USDA Agricultural Statistics, various years.

SOURCES AND LEVELS OF SUBSIDIES

It is clear that a subsidy of at least some functions is required if the MSPB is to provide the optimal amounts of its goods and services and that investment of State funds in the MSPB is an appropriate use of taxpayers' money. The appropriate level of subsidy is a matter for state policymakers to determine, based on the relative merits of all uses of state funds. As was discussed earlier, the previous subsidies to the MSPB have paid significant dividends.

In the course of our investigation, we were able to obtain some information on the subsidy of the seed farm in New York State. It was possible to compare the Maine and estimated New York subsidy levels for FY90. On a percentage and hundredweight basis, the New York subsidy was greater than Maine's, although the Maine subsidy is larger in absolute terms. Given the relative importance of the potato seed industries in the two states, it seems appropriate that Maine invest more heavily in its seed farm than New York. The current subsidy level in Maine is clearly a much larger percentage of state revenues than the New York subsidy. The committee feels, however, that a reduction in the State subsidy at this time could cause long term damage to the reputation of Maine seed gained over the past decade. If it is decided that the subsidy level should change in some way, it is crucial that it be changed gradually over time, rather than all at once, so as to cause as little disruption as possible to the functioning of the MSPB.

The best course of action at the present time probably is for the subsidy to remain at its current level of $245,000 per year, adjusting it periodically for inflation. If Porter Farm production and acreage is significantly reduced as a result of partial privatization of the seed increase function, the subsidy level can be reviewed at a later date.

V. POSSIBLE APPROACHES TO SOLUTION

During the course of our investigations, several suggestions as to the fundamental function and proprietorship of the MSPB operations have arisen repeatedly. These suggestions have ranged from the complete elimination of the MSPB operation to the elimination or relocation of some parts of the operation. This section focuses on these issues of the appropriate and efficient functions of the Board.

CESSATION OF MSPB OPERATION

One policy option would be for the State to withdraw its support from the MSPB. For the reasons discussed above, this would likely mean that many of the functions of the MSPB would be discontinued or significantly reduced. The obvious advantage of this option would be the ability to allocate the annual state subsidy to other uses or to reduce the total state tax burden by that amount. However, this option would be very costly to the people of Maine in general and to the potato industry, in particular. The Maine seed potato industry would be put at a disadvantage relative to its competitors because it would no longer have the "full faith and credit" of a government agency backing the quality of its seed. The industry would have to rely solely on private sources for its seed stock or depend upon state seed farms from other states, assuming they are willing and able to sell to Maine seed producers. This is very unlikely at this time.

It is likely that much of the market share gained by the Maine seed industry in the past decade would be lost to other states and Canada. Much of the genetic diversity maintained at the Porter Farm would be lost because private seed sources would

consider much of it too costly to maintain. It is also likely that the time period required for developing and testing new varieties under Maine conditions would increase, thus putting the Maine seed industry at a further disadvantage.

Much of Aroostook County depends upon the potato industry for a significant portion of its economic base. The Maine seed potato industry has been one of the more stable and profitable components of the potato industry for some time. If the seed potato industry should decline or become less stable as a source of revenue and employment, then a large geographic area of Maine would be affected adversely.

In sum, it is clear that the state investment in the MSPB has paid significant dividends in recent years. With the high probability of the loss of the economic benefits of Loring Air Force Base in Limestone, it would seem to be the wrong time to consider this option seriously.

MAJOR RESTRUCTURING OF THE MSPB

Partial Privatization

Another option to consider is to allow or to cause one or more of the functions currently served by the MSPB to be transferred to the private sector. The discussion above in the section on the economic justification of publicly provided goods and services leads to the conclusion that many of the goods and services provided by the MSPB through state subsidization and control would not be provided in socially optimal amounts by the private sector. This is not necessarily true of all of the goods and services currently provided by the MSPB, however. Certain aspects of the nuclear seed

increase function of the Board could be provided by private growers if the technology were available for producing them on a commercial scale.

The Porter Farm is located on land that is not as productive as much of the other potato producing land in Maine and, therefore, the yields on the Farm are generally below the Maine averages. This location was chosen more for its isolation to reduce the potential for disease transference than for its productivity potential. This isolation was and is the more important of the two factors for this type of operation, but it does restrict the nuclear increase potential on the Porter Farm relative to other locations in Maine. The Porter Farm also is subject to state employee salary rates and work rules, which make its farm labor costs significantly higher than they would be for a commercial farm.

The result is that it is more costly for Porter Farm to increase seed from the N1 and N2 generations to commercial quantities of the N4 generation required by the seed industry on the Porter Farm than it would be on some commercial farms. Also, the earlier the generation, the more costly it is to produce in commercial quantities because more of the increase must take place in the lab and the greenhouse and less in the field. This is true regardless of whether production takes place on the Porter Farm or on a commercial operation, but, given a commercial farm's cost advantage in field production, privately produced increases should be less costly overall and, therefore, could be provided to the industry at a price it could better afford (see Appendix B for more detail). Because of this, it is possible that private growers could purchase N1 and N2 generations at a higher price than is now charged, perform the field increases, sell the

subsequent generations at a lower price than is currently charged and still profit on the activity.

Moreover, the benefits of planting the more vigorous, earlier generations of seed are becoming more well known by the potato industry in general, and buyers are beginning to demand earlier generation seed. At the same time, the technology for producing commercial quantities of the nuclear generations (N1-N4) from disease-free, greenhouse grown minitubers and plantlets (propagules) is being adopted by a few commercial growers in Maine. It appears, then, that market forces are in place, both on the demand side and on the supply side, that will lead toward private provision of earlier generations of some seed varieties. This supply of seed will be in direct competition with the seed from Porter Farm, as it is now organized. It will likely be offered for sale at prices below those at which the Porter Farm can afford to sell its seed with its current cost structure and subsidy level.

It is not likely that all of the nuclear increase function would be taken over by the private sector. The private sector would be expected to undertake the increase function for only the commercial varieties demanded in large volumes at any particular time. Currently, these might include Superior, Atlantic, Katahdin, Norwis, Shepody, Russet Burbank and a few other varieties, but as market demands change, so would the varieties commercial growers are willing to increase. It would remain a legitimate function of the Porter Farm to maintain the capacity to provide limited increases for some of the varieties not currently in demand in large quantities and for promising new varieties. This would retain the genetic diversity for the industry and also provide the basis for

private increases when varietal demand changes over time. This capacity could be maintained in part by a stock of plantlets and/or minitubers of a relatively large number of varieties and by limited field production of up to N2 of a smaller subset of varieties demanded regularly by the industry, but not in quantities that would be attractive enough for private provision of the increases.

The advantages of partial privatization of the nuclear increase function are threefold. First, the seed industry could obtain seed of the most popular varieties at a lower price than could be provided by the MSPB. Second, expensive field production at the Porter Farm would be reduced to a smaller number of acres each year, eliminating the need for some of the field staff currently employed, reducing the wear and tear on already aging equipment, and reducing the amount of management time required for the field operation.

An additional advantage of this sort of partial privatization may come from changing the nature of disease risk. While the concerns regarding the reduced control on private farms are valid, it is the case that by geographically diversifying the early generation stock, the total risk may be reduced. That is, while the risk of infection on any farm may be somewhat higher, if there were a major infection at the Porter Farm, the entire early generation seed stock could be lost. Such an event could damage severely the Maine seed potato industry for many years, while infection on a few farms could be contained and flushed out relatively quickly.

There are also some disadvantages to this option that should be considered carefully. There is a risk of loss of rigid quality control if some of the increases take

place on private farms. This risk includes both reduced tuber quality and disease.[2] Since the Maine seed industry currently enjoys such a good reputation across the country because of the quality and relative disease-free character of its product, a disease outbreak could damage the entire industry for a long period of time. Additional steps could be taken to minimize this risk if this is the direction chosen. There is already a strict set of rules governing private production of nuclear seed, and these rules should be enforced and possibly enhanced.[3] For example, a system should be set up whereby not more than a certain proportion of the increase of one variety would take place on any one farm in any year. This would reduce the risk of failure of an entire year's increase by allocating production across different locations and spreading the risk. It would also prevent economic control of a variety. Private farms producing the nuclear increases should be willing to subject themselves to close scrutiny by state inspectors on a regular basis. This will help to maintain the reputation of quality control that has benefitted the Maine seed industry.

Another strategy for maintaining quality control would be for the MSPB to formally contract out much of the increase function. The seed would remain under the ownership and control of the MSPB, but could be increased at lower cost. A system would have to be worked out so that the industry perceives the contracting process as

---

[2] Some undesirable tuber characteristics do not become apparent until the N2 generation.

[3] Our discussions with seed growers suggest that the current set of regulations may be adequate, but it is felt that the existing rules are not adequately enforced.

impartial and fair. An auctioning of the contracts periodically may be a solution as the number of interested farmers increases.

Another potential disadvantage of partial privatization is that the MSPB would be left with only its highest cost products from which to derive most of its revenue. If the plantlets, minitubers, N1 and N2 generations of seed are priced according to their cost of production on the Porter Farm under this scenario, they may be substantially more expensive than they are currently. Given the additional amount of final product that can be produced from these sources on a private farm and the lower costs on the private farms, however, buyers should be able to afford the seed and produce the increases profitably.

In several places, New Brunswick for example, a reduction in the number of generations produced at public seed farms has been mandated and very quickly implemented. There is some evidence that the rapid implementation of such mandates has caused adjustment problems. In particular, because it requires several years to increase the production of any generation at the seed farm, the supply of seed stock from the seed farms decreased significantly, causing the price of some varieties of seed to rise by large amounts. Many other adjustment problems could be caused by a too rapid implementation of such policies. It is thus felt that a gradual approach to such changes be adopted.

Reallocation of Functions to Other Agencies

During the course of the information gathering phase of this study, many suggestions were made to the Committee about the movement of various functions of the MSPB to other government agencies. This section highlights the suggestions most often heard and the Committee's thoughts on those suggestions.

Make the MSPB an agency under the auspices of the Maine Potato Board. The advantage of this suggestion is that the Maine Potato Board is a quasi-governmental agency and is not subject to all of the labor restrictions as are other government departments. It is not clear why the MSPB could not, on its own, achieve the same status as the Potato Board and, thus, avoid some of the costly state labor rules. Some labor and procurement cost savings could be realized with this option. However, the MSPB would lose some of its status as strictly a government controlled entity and may risk some loss of reputation as an impartial provider of its services. Further, this option would add one more layer of management to an already confusing management structure.

Reallocate the MSPB functions to the Maine Agricultural Experiment Station at the University of Maine. There is no clear advantage to this option, except that there might be more natural interaction between the Program Director of the MSPB and the scientific community. The University is subject to the same costly labor and procurement requirements as a state agency, so there would be very little, if any, cost savings expected from this option.

Across North America, there has been no convergence of the seed farms into one typical structure. About one-third are university-affiliated, one third are state-run, and one third are of other types, including farmer cooperatives. There seems to be no justification, then, at this time to incur the adjustment costs of changing the affiliation of the MSPB.

Shift the Florida Test responsibility of the MSPB to another branch of the Maine Department of Agriculture or cease Florida testing in favor of laboratory disease testing. Shifting the Florida Test from the MSPB to another branch of the Maine Department of Agriculture offers no clear overall advantage to the state budget or the operation of the Florida Test. The Florida Test utilizes technical personnel from the Porter Farm management and field staff at a time when their expertise would be under-utilized at Porter Farm. Maintaining operations at Porter Farm year round and at the Florida Test site in the winter makes better use of existing personnel than would occur if the Florida Test were shifted to another branch of government. Current fees for the Florida Test plus land rental revenues appear to cover costs and provide a small source of revenue for Porter Farm. Removing the Florida Test from the MSPB would thus worsen the overall financial status of the MSPB.

Post-harvest winter testing for disease content of potato seed lots is recognized as being vital by essentially all North American seed producing states and provinces. Sites for winter testing are generally located in Florida or California. Florida reputedly provides better conditions for disease detection and thus is preferred given reasonable geographic proximity. Maine is in an enviable position regarding the Florida Test,

because it purchased its own testing farm in Homestead, Florida prior to recent land value increases in that area. Maine's Homestead Farm is large enough to meet the Board's testing needs and also allows Maine to rent testing space to Canada and Michigan. States and provinces which did not purchase land in the Homestead area cannot afford to do so with current land prices and must either rent from states like Maine or from commercial farmers in the area. The MSPB and Porter Farm management of the Florida test should be given a great deal of credit since Maine's facilities and overall post-harvest test are widely admired within the North American seed potato industry.

Individuals have occasionally suggested that it might be possible to replace the Florida Test with laboratory testing on a massive scale. Proponents of this approach have indicated that laboratory tests are available for many potato diseases, that laboratory tests are more reliable at detecting some diseases, and that sale of Maine's farm in Homestead might generate funds to build and operate a large laboratory for disease testing in Maine.

Opponents point out that post-harvest field testing is the industry standard for North America and that states or provinces that do not have such a test would be at a competitive disadvantage. Field testing offers the advantage that large numbers of tubers from each seed lot can be screened for disease content. Maine uses 400 tubers per seed lot with maximum seed lot size varying among nuclear, foundation, and certified seed categories. Maine currently tests approximately 800,000 tubers in the Florida test.

2,000 and 25

Laboratory tests are generally conducted on a single plant or tuber, thus, a large number of individual tests would have to be conducted to assure as rigorous a test as is provided by field testing. A laboratory test sample consisting of composited tubers would be much less accurate than tests of individual tubers. Laboratory testing on such a large scale would also take considerably more time than the current winter test unless significant investment in laboratory space and staff is made, thus the results might not be available in time to market the current season's seed crop and would thus be of little value.

The result is that field testing is, overall, the more economic choice for large-scale disease screening. Laboratory tests also are not entirely consistent in detecting diseased tubers and plants because virus titre varies among tubers and with the age of the plant. While laboratory testing for viruses X and S is often effective, virus Y and potato leafroll virus are better detected via field testing. Potato spindle tuber viroid show up nicely in the Florida Test, but testing in the laboratory is impractical due to cost. Varietal mixtures and misrepresentation of varietal identity can be detected in the field, but testing in the laboratory is too expensive for these purposes. Based on the above arguments, continued use of the Florida Test for disease content screening appears to be both vital and economical. Laboratory testing by the MSPB should remain in its current supplementary role to be used to confirm questionable symptoms and detect latent infections of viruses which are not clearly detected via field testing.

VI. MANAGEMENT AND LABOR ISSUES

INTRODUCTION

Fundamental to the efficient operation of any organization is the performance of its personnel. Failure to perform adequately may be the result of poor personnel, a poor structure of the management, or poor definition of the roles of individuals. Our examination of the functioning of the Maine Seed Potato Board, and the Porter Farm has convinced us that the most important sources of inefficiencies are the result of poor management structure and job definition.

This should not, in any way, be construed as a reflection on the personal qualities or capabilities of any of the individuals involved with the operations of the Board. On the contrary, during our interviews it was quite clear that everyone with whom we spoke had very strong interest in and concern for the long-term viability of the MSPB operations and were well or exceptionally well qualified for their task. The inefficiencies are in spite of the best efforts of the individuals involved and is the result of a particularly difficult structure.

This section outlines some of the more significant problems, regarding labor and management, that we observed during our investigation. We make a number of suggestions regarding the improved management of the MSPB and Porter Farm.

Current Structure

The management of the Porter Farm operation is divided into three entities; The Maine Seed Potato Board, the Division of Plant Industry of the Maine Department of

Agriculture and the MSPB Program Director. Figure 2 is a representation of the current management structure of the Porter Farm. Each of these entities has a basic set of roles. The MSPB is responsible for major policies, including pricing, variety selection, capital improvements, and technological advancement. The role of the Department of Agriculture is financial control and standards regulation. The role of the Program Director is direct management of the Porter Farm, the Homestead Farm, the scientific integrity of the seed stock production and promotion of the industry. Were these roles entirely separable, then the management structure as it is currently might be appropriate; however, the interdependence of these management functions creates structural difficulties.

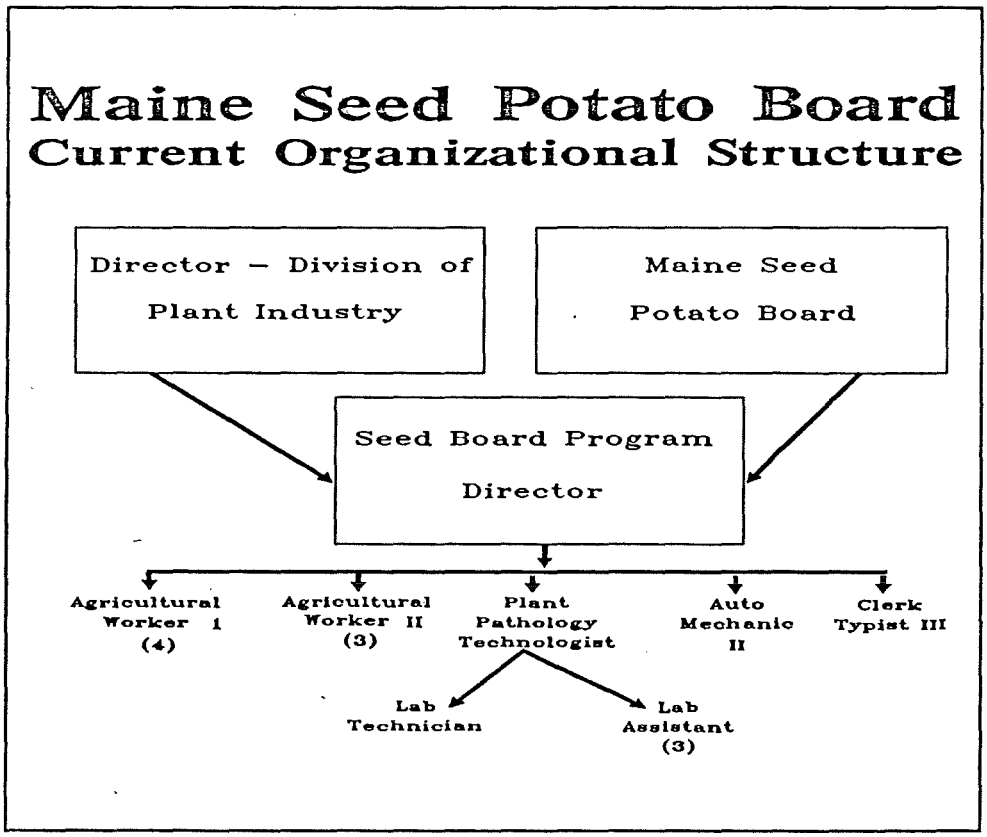

Figure 2

Structural Problems

Problems associated with the management structure of the MSPB and Porter Farm are from two sources. First, the inverted pyramid management structure, with both the MSPB and the Department of Agriculture at the top, creates considerable conflict in determining the course of the operation. Second, the direct management of so many individuals performing so many functions by the Program Director, coupled with his many other assigned roles, makes careful management very difficult. This second issue is exacerbated by the isolation of the Program Director from other management units.

While a division of primary responsibilities, like that described by Figure 2, is normal in public entities, it appears that the separation in the case of the Porter Farm operation is so great as to have caused serious fundamental problems in its management. In this case the objectives of the entities are often in conflict because of differing incentives and physical separation.

In private industry, responsibility for all of the primary managerial functions rests ultimately with a single individual or small group, sometimes subject to the advice and consent of others. Since this individual or group is responsible for policy, finance and implementation, the balancing of these conflicting objectives is a continuous process. With divisions as distinct as they are in the case of the Porter Farm, this cannot possibly be the case. The particular problems for the Porter Farm appear to spring from a combination of differing incentives, missions, and simple physical distance.

The primary concern of the MSPB is to provide the greatest benefit to the Maine seed potato industry. This implies provision of the highest quality seed stock at the

lowest possible price to growers. While this is an appropriate goal, the costs of achieving this goal are not born directly by the Board. Without a responsibility for the costs of achieving these goals it is natural to under-emphasize them.

The primary concern of the Department of Agriculture is to control the costs of the operation, particularly in the current economic climate. Like the MSPB, while this is an appropriate goal, since the effects of the loss of quality or higher prices are not born by the responsible individuals in the Department, they will tend to under-emphasize these goals.

Instructions are received directly from both entities (and from individual members of both entities) by the Program Director. Because of the conflicting primary objectives, instructions from the MSPB and the Department of Agriculture are often in conflict. As a result, it is not possible to satisfy completely either set of instructions. Since there is no realistic mechanism to resolve these fundamental conflicts, they tend to persist. This is further complicated by the reliance on the Legislature to establish the level of the State's subsidy.

The great distance from Augusta to Masardis and between the members of the Board further complicates the managerial role by precluding close day- to-day communications among the three management entities. That conflicts and disagreements have arisen among the management of the Porter Farm is to be expected but appear in this case to have been so severe that the long term viability of the operation may be in jeopardy, despite the best intentions of all involved.

MANAGEMENT STRUCTURE OPTIONS

Structures Defined

The Commission feels that a fundamental restructuring of the management chain of command and decision making process is essential to long term improvement of the situation at the Porter Farm. Long practice suggests that a pyramid structure for management, where any individual answers directly to a sole superior, is the most effective. Such a structure implies a clear chain of command and the responsibility of a single individual to balance goals and resources.

There are two possible options for such a restructuring. The first of the possibilities (Figure 3), is the most easily achieved and requires only that the decisions reached by the MSPB be relayed to the Program Director through the Director of the Division of Plant Industry in whom ultimate responsibility for the successful operation of the Porter Farm would rest. The second requires removing the Department of Agriculture from the direct chain of command, leaving the primary responsibility for balancing program goals and resources in the hands of the MSPB. We focus here on the first of these options as it is clearly the simplest but because of certain difficulties with such a plan and some additional advantages with the second, we provide also a brief discussion regarding the second.

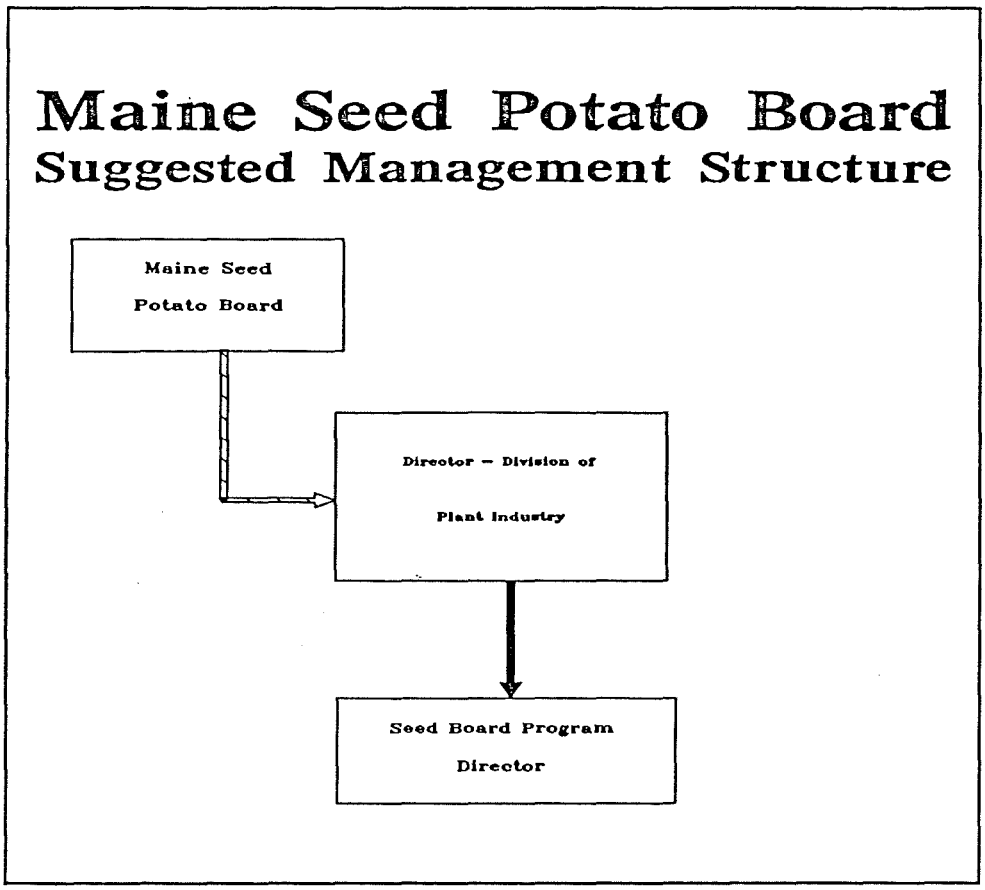

Figure 3

Restructuring as depicted by Figure 3 is clearly a very simple change of the chain of command for the Porter Farm. In this plan, the MSPB advises and instructs the Director of the Division of Plant Industry as to appropriate policy goals and general budget. These would then be adjusted for the budgetary constraints of the MSPB by the Division Director, in consultation with the Program Director. Plans are then implemented by the Program Director. Such a plan would merely adjust the command

structure so that instructions to the Program Director are all filtered through the Division Director, in whom rests ultimate responsibility for decisions.

While this approach addresses the problems of chain of command, there are certain potential difficulties with this approach. Probably the most important difficulty with the approach is the distance between the Division Director and the farm in Masardis and the resulting difficulty of day to day communication. Resolution of this problem would require very specific definitions of the particular decision authority of both the Division and the Program Directors.

Finally, because of the Program Director's closer proximity and frequent dealings with members of the Board, there would probably be a problem of "short circuiting" the chain of command; that is individual members of the Board might be inclined to contact the Program Director directly regarding Board decisions. To the extent that such contacts involve orders, or implicit orders, without the intermediation of the Division Director, the problems associated with the management structure will remain and restructuring is pointless. Under such a structure, the Program Director must be strongly encouraged to refer such contacts to the Division Director. It is incumbent on the Division Director to be available for such communication and to strongly support the chain of command.

The alternative of removing the Department of Agriculture management from the direct chain of command is perhaps a simpler long-run alternative but would require considerably more restructuring than the previous option. The essence of this option is that the operation of the MSPB would be removed from the Department of Agriculture,

except for regulatory authority. The exact legal organization could take on several forms; for example, a non-profit corporation. The authority for inspections and standards would most appropriately remain with the State, but all other management decisions and the responsibility for their outcomes would rest with the board. Since financial independence of the Porter Farm is unlikely in the near future, such a structure would require formal, regular grants-in-aid from the State, which should be in the form of unrestricted operating funds determined in advance of their use.

Under such an option, it is important that the membership of the Board be modified. The selection of Board members should be under more control of the industry, perhaps through an elective process. Some of the positions should be reserved for State appointees with this option.

Such an approach has considerable appeal for several reasons beyond the clarification of the management structure. First, the financial liability of the State would be limited to the operating grants-in-aid. Second, such an organization would be able to purchase equipment and hire labor in a less restrictive environment. Third, such an approach is more amenable to the type of long term financial planning that will be discussed in a later section of this report.

Disadvantages of such an approach include substantial restructuring costs and reduced State control of the functions of the MSPB. The riskiness of reduced State control is discussed elsewhere.

Continued State financial assistance, at least in the near term, is vital to the continuation of the MSPB function. Public funding is necessary and justified on the

grounds of maintaining genetic diversity, economies of size, and the continued research effort of the Board.

Roles of the MSPB, Department, and the Program Director. Under a structure such as that of Figure 3, it is important that the roles of all three of the current management entities be carefully redefined so that there is as little question as possible as to what authority lies where. Under such a plan, the role of the MSPB would be to determine broad policy goals, including, for example, the roles of the MSPB in promotion of Maine seed potatoes, the particular functions to be performed at the Porter Farm or Homestead Farm, new initiatives, capital planning, etc. It must not be the role of the Board or its members to "micro-manage" any of the operations, and all instructions of the Board must be through the Division Director. The Division Director's role should be to balance the broad goals of the Board with the practicalities of budgets and operations. The Division Director must maintain close day-to-day communications with the Program Director and represent the Program Director to the Board. The Division Director must make strong efforts to protect the Program Director from direct interference from other individual in the upper chain of command. The Program Director's role is to carry out the instructions of the Division Director, and advise the Division Director on all matters relating to operations.

Summary

The exact nature of any management restructuring depends heavily on other changes that should take place and are discussed elsewhere in this report. There are, however several principles that if followed, could improve the current situation dramatically.

1. The three functions, policy, financial management and operations management should more clearly rest within the domain of a single entity.

2. A chain of command must be more clearly defined. Under the current structure commands to the Program Director come from multiple sources, and no single individual bears ultimate responsibility.

3. A structure should be determined whereby communication between the parties involved with decision making is greatly facilitated. This would most likely require a reduction in the number of decision making individuals.

4. Provide for formalized input of neutral expert parties to act as intermediators in the resolution of conflicts and as sources of additional expertise. This could imply altering the structure of the Board to include private individuals, or professional consultants, who are neither financially nor personally involved with the potato industry.

LONG RANGE PLANNING

Because of the very long production process and the much longer-term effects of actions on the Porter Farm on the rest of the Maine potato industry, long range planning is of great importance. In the early 1980s, the MSPB implemented some excellent long range planning in the redirection of its activities. Currently, long range planning for the Porter Farm operation is not being carried out effectively. This is the result partly of the current financial crisis, partly of departures from the plan, partly the financial decision rules from the State, and partly the narrow focus only on major capital decisions in the long range planning that does take place.

In the opinion of this Commission, this is another important problem for the long-run health of the Porter Farm operation. The absence of a formalized, detailed, and binding long-range plan and planning process has resulted in many changes of direction and ad hoc decisions, many of which have exacerbated the budgetary difficulties at the Farm. It is certainly important to be able to make day-to-day decisions quickly regarding the operations at the farms and to change direction as the environment changes. However, it is felt that the discipline and careful thought required to formulate a careful long-range plan can enhance the ability to both control costs and adjust to changing circumstances.

It is also important that the long-range plan be designed with the view of balancing a budget including both subsidies and other revenues. Two very important difficulties have prevented effective budget balancing for the Porter Farm; the difficulty of balancing a budget on a year by year basis for an agricultural enterprise with a multi-year production cycle and the inability to impose direct control over labor costs.

IMPROVED FINANCIAL MANAGEMENT

Financial management of any organization operating on a budget is important and its importance increases with the riskiness of the cash inflows and outflows of the organization. For an operation such as the MSPB, where cash inflows are subject to weather and market uncertainty and its cash outflows are, in part, not directly under its control, this aspect of management becomes crucial to its continued effectiveness. Appendix B contains examples of financial records for the MSPB, illustrating their current level of detail, as well as the evolution of the current financial difficulties.

MSPB Financial Records

A crucial input into the process is appropriate past, current, and projected information about the organization. This information usually takes the form of financial statements, such as the balance sheet, the income statement and the cash flow statement, as well as various types of budgets and information from sources outside the organization. This information, when kept in some detail over time, allows the management to evaluate continuously the organization's progress toward its planned objectives and to adjust to technology and market changes as they arise.

The MSPB has, for all practical purposes, three distinct functions: the pre-nuclear production (the lab and greenhouse operation at Porter Farm), the nuclear increase function at Porter Farm, and the Florida Test at the Homestead, Florida site. Each function contributes separately to the overall objectives of the Board. The information required for effective financial management of the Board should, therefore, be maintained separately for each of the functions.

The Program Director of the MSPB has at his disposal the computer capability to implement a more detailed record keeping system. There are available on the market several good financial software packages appropriate for this type of system. For example, Texas A&M Farm Management Extension Group has made available a Lotus-based financial software package for a nominal price. The major stumbling block to implementation of a new system is the effort required to allocate some categories of costs to each function. For example, each salaried employee's time should be assigned to one function and, if some time is spent on another function, the appropriate portion of

the employee's salary should be charged against the second function and a credit made to the original function. This should be done for all categories of fixed costs such as machinery and equipment, salaried employees, utilities, etc.

The maintenance of records at this level of detail would require more time, particularly at first until the new system is learned, but should have high payoffs beginning almost immediately thereafter. The payoffs will be in an improved ability to evaluate the efficiency and effectiveness of each function in contributing to the overall goals and in more realistic product pricing. Emerging problems and opportunities can be identified sooner and more easily, and evaluation and cost control of each function will be much more effective.

Balancing the Budget

Since two of the three functions of the MSPB involve aspects of a commercial farming operation and are subject to direct market forces, the MSPB cannot perfectly predict income in any one year, even with the best financial record keeping system. On a commercial farm or in any other business, inter-year flexibility is achieved through borrowing in the credit market. Currently, the MSPB is not afforded that flexibility since it must balance its budget each year.[4] This reduces significantly the ability of the Board to make long range plans and to take advantage of cost-saving opportunities when they occur.

The ideal circumstance would be to allow the MSPB to participate in the credit markets when the need arises, but this option is currently precluded by its government agency status. The next best option is to require the MSPB to balance its budget over a period of several years, rather than annually. For example, the current deficit could be spread over three years, making it more easily manageable with current resources. The additional funds required to cover the deficit in the short term need not come from the State, but could be provided as a "loan" from the industry through one of several mechanisms. The funds could be raised and provided to the MSPB by the Maine Potato Board on a temporary basis, for example.

[4] There is a limited ability to reallocate deficits from year-to-year by deferred payment of bills. However, this is in effect a one time reduction of costs with the resulting deficit rolled forward from year to year. This tends to exacerbate the deficit in future years.

The danger of this proposal is that it might add to the disincentives already mentioned to operate the MSPB as efficiently as possible. To minimize this tendency, it would be appropriate to require a balanced budget over a relatively short period of time, such as three years.

LABOR MANAGEMENT

Labor Costs

Labor cost is the largest single budget item of the expenditures at the Porter Farm. From 1985 to 1989 expenditures for personnel compensation have ranged from about 39% to 49% of the costs of operating the farm, exclusive of expenditures for new capital. While labor expenditures declined slightly in 1987 and again in 1989, the average increase of labor expenditure at the farm has been more that 6.2% per year and is projected to increase by another 4.3% for the 1991 fiscal year.

It has been suggested repeatedly that the largest cost problem at the Porter Farm is that there are too many employees for an operation of its size. It is certainly correct that a normal complement of 16 full time employees would be extravagant for a 100 acre potato farm, but it is not as clear that this is true for an operation with the multiple functions of the Porter Farm. It is clear, however, that the compensation paid to farm workers at the Porter Farm and the Florida Test site is more than twice that of a private operation. Table 2 contains a summary of the 1991 compensation paid to the MSPB staff. Assuming an average work week of 45 hours and a 50-week work year, the average farm worker's compensation package is equivalent to an hourly wage of $15.26.

The average compensation of skilled farm workers on private farms in Maine is currently $6-8 per hour.

Many of the workers at the Porter Farm and Homestead Farm have significantly more complex duties than workers on a commercial farm. Because special training and extra responsibility for quality control are necessary, the higher wages are, at least in part, justified. Because of this, direct labor cost comparisons with private enterprises are misleading.

Table 2. FY91 Labor Compensation-MSPB

Category of Worker	Number	Average Base Pay	Average Overtime	Average Longevity	Avg. Salary	Average Total Compensation[b]
Supervisory[a]	4	$23,188	$4,597	$414	$28,199	$37,506
Technical and Clerical	4	$15,288	$300	$0	$15,588	$21,175
Farm Workers[c]	5	$20,862	$4,334	$73	$25,269	$34,328
Casual, Non-Permanent	42	$976	0	0	$976	$976

a) Includes Lab Manager, Farm Manager, and NE 107 Coordinator (position eliminated in FY92), but excludes the Program Director.

b) Includes Retirement, Blue Cross, Dental, Life, Medicare, Emp. Health and wages. Excludes any housing benefits.

c) Excludes one permanent part-time worker whose salary is $2100.

Size of Work Force

The data available to the Commission are not sufficient to make a detailed judgement regarding the issue of the quantity of labor, however, it is felt by this Commission that the farm production staff at Porter Farm is probably an area where significant cost savings could be achieved over time. In the next section of this report, recommendations imply that the total acres of production at the Porter Farm be reduced by about 70% if part of the nuclear increase function currently performed on the Porter Farm is contracted out or otherwise taken over by commercial farms. If this is done, then there is an opportunity to decrease labor costs substantially in the farm worker category at the farm. (This could be partially offset by a need for more laboratory and greenhouse help, eventually, but would probably result in significant net savings.[5]) Such a change in the mix of outputs, would provide an opportunity to restructure and reduce this staff to more efficient levels, even under the constraints of State work rules.

If such changes are to be made, they should be made gradually, and by attrition. The changes to the field production suggested in the next section must be made over a number of years, otherwise there are apt to be major adjustment losses to the Maine seed potato industry. Rapidly changing the size of the staff at the Porter Farm could have just as substantial effects. While it might be possible to reduce the staff more quickly than natural attrition would allow, the Committee feels strongly that the potential

[5] Because of increased demand for the earliest generation seed stock, the acreage currently allocated to early generations should be expected to increase. At current MSPB prices this increased demand might be very large, but if prices are increased to more adequately reflect costs, this will be largely offset.

costs to the seed potato industry from a faster scale down are likely to far outweigh any short term savings.

Management Structure

Because of the physical and managerial isolation of the Porter Farm there is the tendency for the Program Director to closely associate with the workers on the farm. While it is generally good for management to be able to identify with the problems and interests of the staff, for effective management there needs to be a clear division between management and staff. Without such a division it is almost impossible for managers to remain totally objective in their decision making process.

At the Porter Farm this problem is exacerbated by the requirement that the manager be a working manager. It is particularly valuable for managers to perform many of the tasks of the staff since it provides a different perspective on problems, the opportunity for close observation, training by example, and the opportunity to reduce labor costs. However, because working shoulder-to-shoulder reduces the already too cloudy division between management and staff it may be significantly less positive in a situation like that at the Porter Farm. For this reason, it is even more important to increase communications between the Program Director and other individuals involved with MSPB management. Under current budget constraints, this will be difficult to implement, but should, nevertheless, be strongly encouraged.

A final problem results from the needs of the Program Director to be away from the Porter Farm, either in the Presque Isle office or traveling for promotion of the seed industry. During these times, there is no clear management structure at the Porter Farm.

To help clarify the distinction between management and staff, help focus the managerial role, and to provide for better management in the absence of the Program Director, it is desirable to establish a managerial hierarchy at the Porter Farm by the use of assistant managers who have a clear set responsibilities and areas that they control within a clearly defined chain of command, as depicted in Figure 4. To implement the suggested on-farm management structure requires only minor modifications of the existing structure and, possibly, no additional personnel. The managerial roles of the Plant Pathology Technologist and Farm Manager require strengthening and clarification. As with the upper management, a chain of command should be established and adhered to as much as is possible. At current production and staffing levels, it is not possible for the Program Director to avoid engaging in the work functions of lower staff, but as the functions of the Board are narrowed, it should be more possible. It should be strongly encouraged that more of the efforts of the Program Director be directed toward oversight and planning, and less toward the physical labor of the Porter Farm.

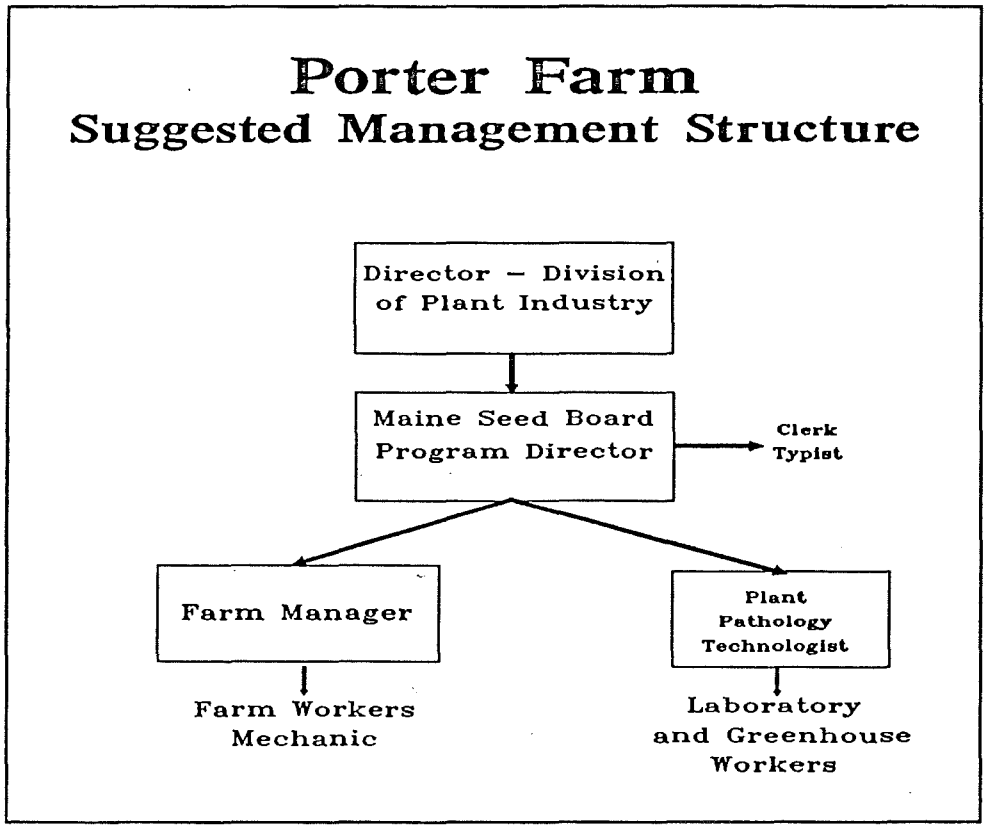

Figure 4

It is a common practice in situations such as this for performance evaluations of management to be performed by superiors who are two levels above. To help establish this new hierarchy at the Porter Farm, it would be most effective for the Division Director to perform regular evaluations of the performance of the assistant managers.

Other Issues

Several issues have been mentioned often in the course of our interviews; most often, the mandatory overtime for long term employees of the farm, and the use of the farm's van to provide transportation to and from the farm. For many years the regular

employees of the farm had worked overtime on such a regular basis that it became an implicit part of the job. When, several years ago, it was decided to end this practice, the employees filed grievances which were resolved with the agreement that overtime would continue to be a standard part of the working arrangements at the Porter Farm. While this is an unfortunate practice, there appears to be little to be done about it under the current structure of the Porter Farm. New employees have been informed that this is not a standard part of their job, so eventually this practice can be phased out.

The practice of providing the Porter Farm's van for transportation to and from the farm has generated considerable controversy. It is certainly questionable why these employees should be entitled to such a perquisite, but it is not clear that this is a costly activity. The practice has been explained on two counts. First, because of the distance of the farm from suppliers, frequent trips to and from Presque Isle can be avoided by allowing an employee to take the van home at night and pick up supplies either after work or before coming to work. Since the van will be traveling to Presque Isle most days, the additional cost of providing transport to employees is very low. Second, because the farm is so distant and the winter driving conditions so often poor, the use of the van in this way reduces absenteeism and makes hiring easier.

While it is possible that this use of the van results in savings, such savings may be counteracted by scheduling inflexibilities. To determine the cost effectiveness of this practice would require a much more detailed study than we are able to provide here. While termination of this use of the van may result in some small savings, or equally small cost increase, the visibility of such a practice is damaging to the reputation of the

farm and its management and for this reason should be either eliminated or carefully justified by the Program Director. In any case, the farm workers' work day should officially begin upon arrival and end upon departure from the Porter Farm, not from Presque Isle.

It has been suggested that this, like the practice of regular overtime, could be subject to a grievance should, it be terminated. In light of this, a clear statement should be issued, that this is not an implicit part of any future employee's compensation.

VII. PRODUCTION AND PRICING

NUMBER OF GENERATIONS

Since the tissue culture and greenhouse steps which result in pre-nuclear seed are the most technical and labor intensive, this seed is very costly to produce. Commercial enterprises often charge $1 to $1.50 per minituber or plantlet.[6] At a 10" spacing, the seed costs for an acre of such material would be over $17,000 (at $1.00 per propagule) compared to about $168 per acre for the $7/cwt G2-G3 foundation seed typically used by processing and tablestock potato growers. The cost per cwt decreases with each field increase beyond the very expensive pre-nuclear stage (see Appendix B for more details), because field propagation is less costly and technical than the pre-nuclear phase and because the cost of the expensive pre-nuclear seed is diluted with each succeeding generation. This increase in the volume of seed in a seed lot is approximately tenfold with each field season. Until recently, the majority of seed sold from the Porter Farm operation has fit the N4 classification. In recent years the MSPB has increased the capacity of tissue culture and greenhouse programs at Porter Farm with the intent of selling mostly N2 and N3 seed to Maine seed growers. Table 3 lists Porter Farm propagule production in recent years and the yields from the pre-nuclear phase obtained at the Porter Farm. The result is that more vigorous seed is available to Maine seed growers. Growers also have a greater opportunity to produce one nuclear generation on

[6] New York currently charges $1.67/propagule ($500/300 lbs.) and the MSPB currently is charging $0.75 per propagule.

their farms, thus diluting the cost of expensive Porter Farm seed over an additional field increase or allowing them to market earlier generation foundation seed to their buyers. Further shifts of nuclear generations to the private sector will enhance this process.

Table 3. Porter Farm Propagule Production Over Time

Crop Year	Number of Varieties	Mini-tubers	Lb. Yield Per Tuber	Plant-lets	Lb. Yield Per Plant-let	Total Prop-agules	Lb. Yield Per Prop-agule
1986-87	116	47,155	0.187	71,660	0.249	118,815	0.224
1987-88	79	59,683	0.272	106,041	0.259	165,667	0.264
1988-89	105	93,677	0.350	148,330	0.330	242,007	0.338
1989-90	99	225,112	0.239	45,778	0.362	270,890	0.259
1990-91	N/A	220,000	N/A	170,000	N/A	390,000	N/A

This Commission recommends that the MSPB continue its policy of shifting toward N1 and N2 production and that qualified growers be allowed to provide the rest of the nuclear seed increases. Within the limits of its capacity, the MSPB should continue to provide minitubers and plantlets to qualified seed growers at prices which are comparable to those of private suppliers.

CONTRACTING AND RISK REDUCTION

One unique aspect of financial management of an agricultural enterprise is that of the high level of uncertainty faced by the manager. The farm manager is faced not only with the vagaries of market forces, but of uncertain production levels, as well. It is,

therefore, important to take advantage of ways to reduce these risks when they are available at relatively low cost. This applies to the MSPB, as well. Over the past several years, the MSPB has made an effort to reduce income risk by encouraging buyers to state their seed buying intentions ahead of time through contracting arrangements. Currently, the MSPB offers to reduce the price by $0.50 per cwt. if the buyer forward contracts seed purchases. This inducement has resulted in approximately 2/3 of the seed purchased from Porter Farm to be contracted in advance. This is an improvement, but still leaves a relatively high level of uncertainty about annual seed sales and production plans.

Given the relatively high cost of production on Porter Farm, missed guesses about which varieties will be desired by the seed industry and in what quantities can be very costly for the MSPB. Further, many of the other publicly supported seed farms in the U.S. are currently requiring all seed purchases to be contracted more than one year in advance. Some also require buyers to bear the burden of shortages and surpluses of seed when they occur. Shortages are allocated across all buyers of the variety, and buyers also are required to purchase a prorated proportion of seed of any variety that is in surplus. This allows the seed farms to manage their production and finances more efficiently.

A 100% contracting requirement would be desirable for the MSPB, as well, but would transfer more of the costs of the risk to the Maine seed industry, in general. However, since the seed producers are closer to the final market for Maine seed and obtain information on changes in market demand sooner and more directly than the

MSPB, it may be less costly in an overall sense for the industry to take on more of this risk.

PRICING

The majority of the Porter Farm seed for the 1991-92 crop year has been priced between $26 and $35 per cwt. There is a price reduction of $0.50 per cwt. for pre-contracted seed and a $1.00 per cwt. reduction for seed able to be delivered in bulk. Seed prices have increased substantially over the past few years since the FY90 cost-cutting measures were instituted. The estimated revenue from seed sales in FY91 is $485,000 compared to an expected revenue from seed sales of $425,700 in FY92 estimated at the end of March (see Appendix C). It is not clear whether this decrease in revenue is due to the price increases, to the increased availability of some early nuclear seed stock from private sources, or to just an annual aberration based on yearly differences in production.

There are two strategies for pricing the seed stock from the Porter Farm. The one which appears to be currently in place is to price the seed separately from consideration of its cost of production, basing the price primarily on what the MSPB feels the industry can afford to pay and loosely on the Board's budget constraints. The second, used by most other seed farms, is to price the seed as a residual, based on the projected costs of producing it, less any subsidy, and the quantities contracted ahead by the buyers. From the state and the MSPB's budgeting point of view, the latter strategy is preferable. Of course, buyers of seed would naturally like the seed to be priced before they submit their seed requests.

Given the current financial crisis, it seems the MSPB has no other choice but to move toward the second pricing strategy. Once a more detailed budgeting system is in place, it will be relatively easy to price the Board's products according to their costs of production, net of any subsidy attributed to them. Some general suggestions for pricing the seed include: pricing earlier generations at a premium that reflects their increased potential and the higher cost of producing them, charging a higher premium for specialized varieties that are produced in small quantities, charging a substantial premium or not allowing seed sales that are not contracted ahead of time. Also, given the industry's increased demand for earlier generations of seed, the minitubers and plantlets produced at the farm will likely become more important products. Given the Porter Farm's reputation for reliability, these products could be priced at a premium over those available from other sources, such as Plant Genetics, Inc.

Previous pricing practice of the MSPB was to charge the same price per cwt. for all generations of seed. Recently, this practice has been changed, in that earlier generations are priced at a premium over later generations. In 1991, N2 seed was sold for $35/cwt. This change took place with some resistance from the seed industry, but has been accepted as growers have come to understand the improved quality and production potential of the earlier generation seed. It appears, however, that the early generation premiums are not adequate to recover the costs of the early generation seed stock. It is the opinion of the Commission that the earlier generation premiums should be increased significantly to more adequately reflect their costs. Appendix B presents some more detail regarding this pricing issue.

A thorough review of the pricing of other MSPB products and services is also warranted. For example, rents charged at the Florida Test site may be able to be increased, as well as inspection fees, etc. Rents charged to workers using the Porter Farm and Homestead Farm's housing should be reviewed, as well, given these workers' relatively high levels of other compensation.

Until some major decisions about the future structure and plans of the MSPB are finalized, it is impossible to be more precise about the pricing structure. In the future, prices will have to be more reflective of actual production costs if the Board is to bring its operating deficit under control.

VARIETY SELECTION

The Maine potato industry is a diverse industry with several major marketing outlets. Major marketing segments with unique varietal needs include seed producers, tablestock growers, processing growers for chips, and processing growers for french fries. Within each of these major groups several varieties are needed to meet various growing season lengths, pest resistance needs, marketing niches, and storage needs. The result is that seed growers must produce a fairly large number of varieties just to meet the needs of the Maine potato industry. In addition, Maine's seed potato industry is a major seed potato marketer east of the Mississippi River, marketing seed as far south as Florida and west into the upper midwest. Each geographic region has unique varietal requirements due to marketing opportunities, varietal adaptation to climate, and local pest conditions. The end result is that Maine's seed potato industry produces a very large and diverse

group of varieties. This selection of varieties fluctuates over time depending on the prevailing market and production conditions in a wide geographic area.

During 1990, Maine growers certified 24,597 acres of seed potatoes, representing 71 named potato varieties and 27 numbered seedlings or experimental lines. It is the responsibility of the MSPB and Porter Farm management to supply the nuclear seed needs for this diverse group of varieties. These totals exclude numbered selections introduced into Maine and maintained via contractual arrangements between seed growers and Frito-Lay, Inc. Of the varieties certified in Maine, only seven varieties had certified acreage exceeding 1,000 acres each. Total certified acres for this group were 19,226 acres (81% of the non Frito-Lay acreage). Twenty-six varieties were produced on 50 or more certified acres with total production of 22,515 acres (94% of the non Frito-Lay acreage). Fifty-three varieties were produced on less than 10 acres and of this group, 32 were produced on less than or equal to one acre.

Table 4 contains a summary of the MSPB's varietal selection and Porter Farm production in recent years. The Porter Farm management is often criticized for producing too many potato varieties; however, it is difficult to maintain a small "magic" number of potato varieties due to the nature of the Maine potato industry. Arguments are made that production of large numbers of small acreage varieties is more expensive than the production of large acreage varieties. It is also argued that production of numerous small-lot varieties takes greenhouse and laboratory time away from varieties that have a higher priority with the industry (i.e established major varieties and "hot" new releases such as Russet Norkotah, Norwis, and Mainechip).

Table 4. Porter Farm Nuclear Seed Production Over Time

Crop Year	FY	Number of Varieties	Acres Planted	CWT/Acre Yield
1987	88	96	112	218.6
1988	89	67	94	224.7
1989	90	80	95	248.0
1990	91	94	101	190.2

The following factors contribute to the large number of varieties grown at Porter Farm: 1) The diversity of Maine potato industry's markets and marketing channels results in a large number of small acreage, niche varieties being needed; 2) Even in the limited area representing Maine, no perfect variety exists and growers are continuously evaluating and searching for new varieties that will offer advantages in pest resistance, storage quality, and for various marketing channels; 3) The MSPB has over the past 20 years supported new potato variety development in the Northeast by propagating disease-free seed for experimental use and evaluation via regional project NE-107 ("Breeding and Evaluation of Potato Clones and Varieties in the Northeastern States"); 4) Porter Farm propagates seed of potato seedlings from the USDA breeding program under the terms of a $25,000 contract; 5) The Porter Farm management has actively acquired breeding material and newly released lines from outside the Northeast region for evaluation beyond the scope of the NE-107 project.

Several years ago, the MSPB directed Porter Farm management to produce only 60 varieties for commercial sale. In addition, the MSPB directed Porter Farm management to require seed producers to contract their total purchases one year in

advance. Contracting has been received positively by the Maine seed industry, although, as mentioned earlier, only 2/3 of Porter Farm production was contracted in 1991. As of March 1991, contract requests for the 1992 marketing season (1991 cropping season) totaled 15,245 cwt. This total is 3,000 cwt above the previous season and represented 55 varieties and numbered seedlings. Of the total, 11,719 cwt are being contracted as N3, while the balance is contracted at N2. The general success of Porter Farm management in meeting the seed requests of the Maine industry is indicated by the fact that Porter Farm should be able to meet all of these contract requests with the exception of two varieties (Mainechip and Norwis). At its March planning meeting, the Porter Farm management presented a list of potential plantings for commercial sale based on N1 and N2 seed available from its 1990 field increases (see Appendix A). The list included 29 numbered seedlings and 59 named varieties. Available seed would allow planting of 109 acres on Porter Farm and associated rented land. The stated goal of the Porter Farm management was to reduce this number to 80 varieties totaling 100 acres. A larger list of seedlings and varieties would be planted in small lots from pre-nuclear stocks (minitubers and plantlets) produced in three greenhouse crops during 1990-91.

Other nuclear seed programs are also forced to produce large numbers of potato varieties due to the nature of their industries. New York produces 38 varieties for an industry that certifies only 1,344 acres. Wisconsin produces 42 varieties for a 10,000 acre seed industry, while New Brunswick produces 64 varieties.

Potato acreage at Porter Farm should be limited to less than 100 acres so that a 3-year rotation can be utilized on its available based of land. Relative to shorter

rotations of 2-years or less, a 3-year rotation helps maintain the quality of the Porter Farm seed crops by preventing disease infestations and also helps maintain high yields. If Porter Farm acreage is not maintained at 100 or less, additional land may have to be purchased or leased if the present production systems is retained. This seems unacceptable given the MSPB budget. Therefore, changes in the production system as outlined elsewhere in the text or additional sources of revenue should be considered.

While the precise number of varieties that should be produced at Porter Farm is difficult to establish due to complex industry needs and lack of information on costs of producing small volume seed lots, it is the consensus of this Commission that numbers of varieties offered for commercial sale be given an upper limit. Production of 70 to 80 varieties for commercial sale appears to be a workable upper limit given current production levels, contracts, and the nature of the industry. The Commission further recommends that the Porter Farm management continues to strictly enforce a forward contracting practice for both large volume and small volume varieties. The Commission acknowledges that the major priority of Porter Farm should be to produce those varieties which are certified on relatively large commercial acreage (i.e. >50 acres); however, the Commission also feels strongly that the role of the MSPB in maintaining potato germplasm, supplying a limited number of minor varieties, and fostering development of new potato varieties should be maintained. Attention to such needs is a major advantage of a publicly funded institution when compared to a large private business.

VIII. OPTIONS TO DEAL WITH THE MSPB'S IMMEDIATE BUDGET PROBLEMS

As is discussed throughout preceding sections of the report, the MSPB is facing some problems requiring immediate attention. These are its large, current budget deficit and the immediate need to begin setting aside a reserve for capital replacement. Given the size of the current labor force at the Porter Farm, it would seem to follow that layoffs of two or more farm workers and/or laboratory staff might solve these immediate problems. This is not a viable option, however, given the short time frame available to solve the budget deficit problem and the State work rules under which the layoffs would take place. Also, the sensitive nature of the production at Porter Farm is dependent heavily upon the good faith of the farm workers. The Commission recommends, therefore, that staff reductions in the future be limited to natural attrition (resignations and retirements), if possible, to guard against long term damage to the seed stock at Porter Farm.

In fact, there are no cost reduction measures that would solve the problems under the current circumstances. The options available are, therefore, limited to finding a temporary source or sources of additional funds with which to cover the current deficit.

The Commission has identified four options from which to derive this temporary increase in funds required by the MSPB. Any of these options could be implemented separately or in combination to produce the desired result. They are:

1. Delay payment of accounts payable (roll over the deficit into the next fiscal year) and recover the deficit with next year's seed sales through a temporary seed price increase or through any of the other means listed in Options 2-4.

2. Obtain a short-term, emergency loan from the Maine Potato Board's reserve account to cover the deficit and to begin a capital reserve account. The loan could be repaid in the next fiscal year through a temporary seed price increase or a temporary increase in the Potato Tax as in Option 4.

3. Obtain an emergency appropriation or an emergency loan from the Legislature. A loan could be repaid in the next fiscal year through a temporary seed price increase or a temporary increase in the Potato Tax as in Option 4.

4. Institute immediately a temporary increase in the Potato Tax of $0.01/cwt. This would generate approximately $175,000-$200,000 with which to cover the deficit and to begin a capital reserve account for the MSPB. Assuming an average yield of 250 cwt/acre and a typical farm size between 150 and 200 acres, the average impact on an individual producer is estimated to be approximately $375-$500.

Options 1 and 2 could probably be accomplished more quickly than the other Options. Option 1 has the disadvantage that the problem could be compounded in the next fiscal year and more drastic action would have to be taken at that time. Option 2 would require agreement of the Potato Board to draw down its reserves substantially and might take some time to negotiate the terms of the loan, etc. Option 3 seems remote at this time, since the Legislature does not have additional funds at its disposal currently. A temporary increase in the Potato Tax (Option 4) could solve the immediate problems of the MSPB and has the advantage that the funds would come from those who are the most direct beneficiaries of the MSPB's services. It might take some time to implement, however, since it could require public hearings and further legislative action. Some delay of payments to the MSPB's creditors seems unavoidable, although this should be kept to as short a time period as possible.

IX. SUMMARY OF LONGER TERM RECOMMENDATIONS

The investigations and deliberations of the Commission have led to the following broad conclusions:

A. The good reputation and financial success of the Maine seed potato industry in recent years has been due in large part to the efforts of the Maine Seed Potato Board and its Program Director and staff.

B. The Porter Farm facility and the Florida Testing program of the Maine Seed Potato Board are critical for the maintenance of the good reputation and future financial success of the Maine seed potato industry.

C. There are some improvements that can be made in the structure and operation of the Maine Seed Potato Board to assure its continued viability and enhance its efficiency.

Therefore, the Commission makes the following recommendations:

POLICY AND MANAGEMENT

1. The Seed Board should be reconstituted as the broad policy setting body for the seed potato industry. It should forward its decisions and recommendations to the Director of the Division of Plant Industry of the Maine Department of Agriculture, Food, and Rural Resources. The position of Program Director of the Seed Board should be solely within the Division of Plant Industry of the Maine Department of Agriculture, Food and Rural Resources and be responsible directly to the Division Director. State subsidization of the functions of the Seed Board should remain at its current level and be adjusted for inflation on an annual basis. This subsidization may, in part, take the form of the salaries of the Program Director, supervisory personnel at the Porter Farm and Homestead Farm facilities, and the laboratory and greenhouse staff at the Porter Farm facility.

Evidence supporting Recommendation 1 can be found on pages IV-1 to IV-10 and VI-1 to VI-10.

2. The Seed Board should begin immediately to formulate a long-range plan in consultation with representatives of the seed industry. This plan should include long term goals and a timetable for accomplishment and detailed long range capital, marketing, production and research plans. This plan should be used as a guide to the future operation of the Porter and Homestead Farms, unless

important circumstances necessitate a change in the plan. Any changes in the plan should be made formally and in writing.

Evidence supporting Recommendation 2 can be found on pages VI-10 to VI-11.

3. Given the market uncertainties faced by the Seed Board, the Seed Board should be required to produce a balanced budget (including subsidies) over any three year period, beginning with FY92.

Evidence supporting Recommendation 3 can be found on pages VI-14 to VI-15.

4. The Program Director should begin immediately to develop a system of record keeping in which the budgets and financial records of the three major functions of the Seed Board (lab and greenhouse, Porter Farm field production and Homestead farm production and testing) are kept separately so that information is generated to facilitate more efficient and productive management decisions.

Evidence supporting Recommendation 4 can be found on pages VI-11 to VI-13.

5. The position description of the current Farm Manager at the Porter Farm should be changed to include not only supervisory responsibilities, but budgetary and management responsibilities, as well. The position description of the Plant Pathology Technologist should be changed to include budgetary responsibility and management of the laboratory and greenhouse operations at the Porter Farm. The Program Director should be directly responsible for the Farm Manager and the Plant Pathology Technologist, as well as the clerk typist position, but be only indirectly involved with the daily supervision of other staff. The Program Director, the Farm Manager and the Plant Pathology Technologist should be evaluated formally on an annual basis by the Director of the Division of Plant Industry.

Evidence supporting Recommendation 5 can be found on pages VI-1 to VI-10 and VI-18 to VI-22.

PRODUCTION AND PRICING

6. The Seed Board should begin immediately to move toward production of seed at no higher than the N2 generation. The N2, N3, and N4 generations should be undertaken by private growers. This should be fully accomplished by FY95. This change should result in a savings of at least 20% of the Porter Farm operating budget and a reduction of production to no more than 30 acres. It would be desirable that the Board's longer term plans should include production of no higher than N1 and sale of pre-nuclear seedstocks (minitubers and plantlets) for use by industry seed growers.

Evidence supporting Recommendation 6 can be found on pages VI-1 to VI-8 and VII-1 to VII-2.

7. If the perception of the seed industry is that maintenance of control of seed stocks is a concern under the new structure, the Seed Board should institute a system of contracting with private growers for the production of the N2 and later generations seed. This system, if instituted, should be in place by FY95.

Evidence supporting Recommendation 7 can be found on pages V-5 to V-7.

8. Seed buyers should be required to enter into a binding contract for all of their pre-nuclear and nuclear seed purchases from the Porter Farm. This contract should be entered into at least 12 months prior to sale and should include provisions for buyers to share in any surplus or deficit that results in varieties for which they have contracted.

Evidence supporting Recommendation 8 can be found on pages VII-2 to VII-4.

9. Pricing of the Seed Board's products and services should be changed, beginning with the 1993 contracts, to reflect their true costs of production, less any subsidy attributed to them. A substantial premium should be charged for varieties sold in small volumes, with the exception of those varieties discussed in Recommendation 13.

Evidence supporting Recommendation 9 can be found on pages VII-4 to VII-6.

10. The Seed Board should begin immediately to offer no more than 70 to 80 varieties for commercial sale.

Evidence supporting Recommendation 10 can be found on pages VII-6 to VII-10.

11. The Seed Board should continue to support the NE-107 project and Northeast potato breeding programs via propagation of disease-free seed; however, costs for such support should be recovered completely through seed pricing, grants, and/or contracts.

Evidence supporting Recommendation 11 can be found on pages IV-3 to IV-5 and VII-6 to VII-10.

12. Only varieties that have been fully evaluated through small-plot testing in the NE-107 trials and judged favorable should be offered for commercial sale from Porter Farm.

Evidence supporting Recommendation 12 can be found on pages VII-6 to VII-10.

13. To facilitate new variety development, the premium on varieties sold in small volumes should be waived for three years after the varieties have been named and released.

Evidence supporting Recommendation 13 can be found on pages IV-3 to IV-6 and VII-6 to VII-10.

14. A system should be established at the Porter Farm so that a limited number of promising new varieties from the Maine Potato Breeding Program or other breeding programs can be given higher priority than minor varieties which have little long-term potential for acreage increases.

Evidence supporting Recommendation 14 can be found on pages IV-3 to IV-6 and VII-6 to VII-10.

APPENDIX A

SEED CONTRACT FOR THE 1991 CROP

MAINE DEPARTMENT OF AGRICULTURE, FOOD & RURAL RESOURCES
MAINE SEED POTATO BOARD
744 Main Street Suite 9
Presque Isle, Maine 04769
764-2037 Office, 435-6060 Farm

Dear Seed Grower:

Production at Porter Farm of all varieties of seed potatoes will be offered on a contractual basis for the 1991 crop. This action is being taken to reduce production costs by producing Nuclear seed potatoes in quantities more closely tuned to grower demand. It is not anticipated growers will contract all that can be produced of the more popular varieties, but those growers who decide to contract will receive their portion of the supply before the balance is allocated in the spring of 1991.

There is a list attached to indicate the varieties and seedlings that will be produced in 1991 and the approximate quantity of each that can be produced with the seed that is available. If you are interested in purchasing Nuclear seed potatoes of these varieties and seedlings from the 1991 crop at Porter Farm then PLEASE fill out the enclosed form indicating the varieties and amounts that you would like to purchase in 1991. Return the form to the Maine Seed Potato Board , 744 Main Street, Suite 9, Presque Isle, Maine 04769. The price for the seed potatoes will be established in January, 1992. Upon receipt of the requests and allocation of the seed potatoes to be produced a letter of agreement will be returned to you for your signature and a deposit of $6.00/cwt.

Thank you.

Sincerely,

David Hammond
Program Director

CONTRACT LIST FOR 1991 CROP

CHARACTERISTICS OF VARIETIES AND SEED

VARIETY	TUBER CHARACTERISTICS	UTILIZATION	CWT THAT CAN BE PRODUCED	GEN#	CWT REQUESTED
A 7411-2	LONG, RUSSET SKIN, WHITE FLESH	PROCESSING, TABLE	80	N3	_____
AF 1060-2	ROUND, WHITE SKIN AND FLESH	TABLE	15	N2	_____
AF 828-5	ROUND, WHITE SKIN AND FLESH	TABLE	50 50	N2 N3	_____ _____
AF 875-15	ROUND, WHITE SKIN AND FLESH	CHIP, TABLE	35	N2	_____
ALASCLEAR	ROUND-OBLONG, WHITE SKIN AND FLESH	TABLE	35	N2	_____
ALASKA RUSSET	LONG, RUSSET SKIN, WHITE FLESH	TABLE	60	N2	_____
ALL BLUE	ROUND-OBLONG, BLUE SKIN AND FLESH	TABLE	35	N2	_____
ALLEGANY	ROUND, WHITE SKIN AND FLESH	TABLE, CHIP	25 80	N2 N3	_____ _____
ATLANTIC	ROUND, BUFF-WHITE SKIN AND FLESH	SEED, TABLE, CHIP	2500	N3	_____
B 0045-6	LONG, RUSSET SKIN, WHITE FLESH	PROCESSING	100	N2	_____
B 0172-15	ROUND, WHITE SKIN AND FLESH	CHIP	65	N2	_____
B 0172-22	ROUND, WHITE SKIN AND FLESH	CHIP	10	N2	_____
B 0175-20	ROUND, WHITE SKIN AND FLESH	CHIP	30	N2	_____
B 0179-17	ROUND, WHITE SKIN AND FLESH	TABLE, CHIP	55	N2	_____

==========

RETURN THIS SIGNED REQUEST BY 4/1/91 TO: MAINE SEED POTATO BOARD, 744 MAIN ST., SUITE 9, PRESQUE ISLE, ME 04769

GR#:_____ SIGNATURE:_____ TELEPHONE: _____

ADDRESS: _____ SOCIAL SEC. #: _____

INSPECTOR:_____

VARIETY	TUBER CHARACTERISTICS	UTILIZATION	PRODUCED	GEN#	REQUESTED
B 0186-1	LONG, RUSSET SKIN, WHITE FLESH	PROCESSING, TABLE	15	N2	_____
B 0190-9	LONG, RUSSET SKIN, WHITE FLESH	TABLE	15	N2	_____
B 0326-32	LONG, RUSSET SKIN, WHITE FLESH		45	N2	_____
B 0396-1	ROUND, WHITE SKIN YELLOW FLESH	TABLE	20	N2	_____
B 9792-158	ROUND, WHITE SKIN AND FLESH	CHIP, TABLE	10	N2	_____
B 9792-2B	ROUND, WHITE SKIN AND FLESH	CHIP	45	N2	_____
B 9792-61	ROUND WHITE SKIN AND FLESH	CHIP	175	N2	_____
B 9792-8B	ROUND, WHITE SKIN AND FLESH	CHIP, TABLE	35	N2	_____
B 9922-11	LONG, RUSSET SKIN, WHITE FLESH	TABLE, PROCESSING	40	N4	_____
BANANA	LONG, YELLOW SKIN AND FLESH	TABLE	50	N3	_____
BELRUS	LONG, RUSSET SKIN, WHITE FLESH	TABLE PROCESSING	75 100	N2 N3	_____ _____
BINTJE	LONG, WHITE SKIN, YELLOW FLESH	TABLE	75	N2	_____
BLUE MAC	ROUND, PURPLE SKIN, WHITE FLESH	TABLE	25	N2	_____
CAMPBELL 13	ROUND,WHITE SKIN AND FLESH	TABLE, CHIP	150	N3	_____
CASTILE	OBLONG-LONG, WHITE SKIN AND FLESH	PROCESSING, CHIP,TABLE	40	N3	_____
CAROLA	ROUND-OBLONG, YELLOW SKIN AND FLESH	TABLE	65	N2	_____

==========

RETURN THIS SIGNED REQUEST BY 4/1/91 TO: MAINE SEED POTATO BOARD, 744 MAIN ST., SUITE 9, PRESQUE ISLE, ME 04769

GR#:_____ SIGNATURE:_____ TELEPHONE: _____

ADDRESS: _____ SOCIAL SEC. #: _____

INSPECTOR:_____

VARIETY	TUBER CHARACTERISTICS	UTILIZATION	CAN BE PRODUCED	GEN#	CWT REQUESTED
CHERRY RED	ROUND, RED SKIN, WHITE FLESH	TABLE	20	N2	_____
CHIPPEWA	ROUND, WHITE SKIN AND FLESH	TABLE	125	N3	_____
COASTAL CHIP	ROUND, WHITE SKIN AND FLESH	CHIP	60 125	N2 N3	_____ _____
COASTAL RUSSET	LONG, RUSSET SKIN, WHITE FLESH	TABLE	90 175	N2 N3	_____ _____
CS 7232-4	ROUND, WHITE SKIN AND FLESH	CHIP, TABLE	40	N2	_____
CS 7697-24	ROUND, WHITE SKIN AND FLESH	TABLE	25	N2	_____
DARK RED NORLAND	ROUND, RED SKIN, WHITE FLESH	TABLE	70	N2	_____
DELTA GOLD	ROUND, WHITE SKIN, YELLOW FLESH	TABLE, CHIP	15	N2	_____
DESIREE	ROUND-OBLONG, RED SKIN, YELLOW FLESH	TABLE	30	N2	_____
EIDE RUSSET	LONG, RUSSET SKIN WHITE FLESH	TABLE PROCESSING	100	N2	_____
ELBA	ROUND, WHITE SKIN AND FLESH	TABLE	65	N2	_____
FL 657R	ROUND, RUSSET SKIN YELLOW FLESH	CHIP, TABLE	40	N2	_____
FRONTIER RUSSET	LONG RUSSET SKIN WHITE FLESH	PROCESSING TABLE	60	N2	_____
GEMCHIP	ROUND, WHITE SKIN AND FLESH	CHIP, TABLE	60	N2	_____
GREEN MOUNTAIN	ROUND, OBLONG, WHITE SKIN AND FLESH	TABLE	35	N2	_____
HUDSON	ROUND, WHITE SKIN AND FLESH	TABLE	15	N2	_____

==========

RETURN THIS SIGNED REQUEST BY 4/1/91 TO: MAINE SEED POTATO BOARD, 744 MAIN ST., SUITE 9, PRESQUE ISLE,ME 04769

GR#:_____ SIGNATURE:_____ TELEPHONE: _____

ADDRESS: _____ SOCIAL SEC. #: _____

INSPECTOR:_____

VARIETY	TUBER CHARACTERISTICS	UTILIZATION	PRODUCED	GEN#	REQUESTED
KANONA	ROUND, WHITE SKIN AND FLESH	TABLE, CHIP	25	N2	_____
KATAHDIN	ROUND, WHITE SKIN AND FLESH	TABLE	1,000	N3	_____
KENNEBEC	ROUND TO OBLONG, WHITE SKIN & FLESH	TABLE, CHIP	100 100	N2 N3	_____ _____
KRANTZ	OBLONG-LONG, RUSSET SKIN, WHITE FLESH	PROCESSING	100	N2	_____
LA 12-15	ROUND, RED SKIN WHITE FLESH	TABLE	60 25	N2 N3	_____ _____
LA BELLE (LA 01-38)	ROUND, WHITE SKIN AND FLESH	TABLE, CHIP	75	N2	_____
LA CHIPPER	ROUND, WHITE SKIN, AND FLESH	TABLE	25 50	N2 N3	_____ _____
LA ROUGE	ROUND, RED SKIN, WHITE FLESH	TABLE	200	N3	_____
LANGLADE	ROUND, WHITE SKIN AND FLESH	TABLE, CHIP	15 25	N2 N3	_____ _____
MAINECHIP (AF 875-16)	ROUND, WHITE SKIN AND FLESH	CHIP	100	N2	_____
MICHIGOLD	ROUND, WHITE SKIN, YELLOW FLESH	TABLE	80	N2	_____
MONONA	ROUND, WHITE SKIN AND FLESH	CHIP	200 200	N2 N3	_____ _____
ND 1538-1RUSS	LONG, RUSSET SKIN WHITE FLESH	TABLE PROCESSING	60	N2	_____
ND 2224-5R	ROUND, RED SKIN, WHITE FLESH	TABLE	20 40	N2 N3	_____ _____
ND 651-9	ROUND, WHITE SKIN AND FLESH	CHIP	125	N2	_____
ND 671-4RUS	LONG, RUSSET SKIN WHITE FLESH	TABLE PROCESSING	75	N2	_____

==========

RETURN THIS SIGNED REQUEST BY 4/1/91 TO: MAINE SEED POTATO BOARD, 744 MAIN ST., SUITE 9, PRESQUE ISLE, ME 04769

GR#:_____ SIGNATURE:_____ TELEPHONE: _____

ADDRESS: _____ SOCIAL SEC. #: _____

INSPECTOR:_____

VARIETY	TUBER CHARACTERISTICS	UTILIZATION	SEED TO BE PRODUCED	GEN#	REQUESTED
ND 860-2	ROUND, WHITE SKIN AND FLESH	CHIP	20	N2	_____
NORCHIP	ROUND, WHITE SKIN AND FLESH	CHIP	100	N3	_____
NORKING RUSSET	LONG, RUSSET SKIN, WHITE FLESH	PROCESSING TABLE	15 40	N2 N3	_____ _____
NORWIS	ROUND, WHITE SKIN AND FLESH	TABLE CHIP	50 800	N2 N3	_____ _____
NY 85	ROUND, WHITE SKIN AND FLESH	TABLE, CHIP	40	N2	_____
ONAWAY	ROUND, WHITE SKIN AND FLESH	TABLE, CHIP	90	N2	_____
PRESTILE	ROUND, WHITE SKIN AND FLESH	TABLE	15	N2	_____
RED CLOUD	ROUND, RED SKIN, WHITE FLESH	TABLE	35	N2	_____
RED LA SODA	ROUND, RED SKIN, WHITE FLESH	TABLE	100	N2	_____
RED PONTIAC	ROUND, RED SKIN, WHITE FLESH	TABLE	75	N2	_____
REDDALE	ROUND, RED SKIN, WHITE FLESH	TABLE	20 80	N2 N3	_____ _____
REDSEN	ROUND, RED SKIN, WHITE FLESH	TABLE	25	N2	_____
RUSSET BURBANK	LONG, RUSSET SKIN, WHITE FLESH	PROCESSING	100 2,000	N2 N3	_____ _____
RUSSET NORKOTAH	LONG, RUSSET SKIN, WHITE FLESH	TABLE	2,000	N3	_____
SAGINAW GOLD	ROUND, WHITE SKIN, YELLOW FLESH	TABLE, CHIP	40	N3	_____
SANGRE	ROUND, RED SKIN, WHITE FLESH	TABLE	25	N3	_____
SHEPODY	LONG, WHITE SKIN AND FLESH	PROCESSING	2,500	N3	_____

RETURN THIS SIGNED REQUEST BY 4/1/91 TO: MAINE SEED POTATO BOARD, 744 MAIN ST., SUITE 9, PRESQUE ISLE,ME 04769

GR#:_____ SIGNATURE:_____ TELEPHONE: _____

ADDRESS: _____ SOCIAL SEC. #: _____

INSPECTOR:_____

VARIETY	TUBER CHARACTERISTICS	UTILIZATION	COULD BE PRODUCED	GEN#	CWT REQUESTED
SOMERSET	LONG-OBLONG, WHITE SKIN AND FLESH	CHIP, TABLE	250	N2	_____
STEUBEN	ROUND, WHITE SKIN AND FLESH	CHIP	60	N2	_____
SUNRISE	ROUND, WHITE SKIN AND FLESH	TABLE, CHIP	25 400	N2 N3	_____ _____
SUPERIOR	ROUND, WHITE SKIN AND FLESH	TABLE	100 3,000	N2 N3	_____ _____
WAUSEON	ROUND, WHITE SKIN AND FLESH	TABLE	35	N2	_____
WF 31-4 (ATLANTIC)	ROUND, BUFF WHITE SKIN AND FLESH	CHIP,TABLE	250	N3	_____
YUKON GOLD	ROUND, YELLOW SKIN AND FLESH	TABLE	50	N2	_____

==========

RETURN THIS SIGNED REQUEST BY 4/1/91 TO: MAINE SEED POTATO BOARD, 744 MAIN ST., SUITE 9, PRESQUE ISLE,ME 04769

GR#:_____ SIGNATURE:_____ TELEPHONE: _____

ADDRESS: _____ SOCIAL SEC. #: _____

INSPECTOR:_____

APPENDIX B

THE COST OF PRODUCING SEED STOCK BY GENERATIONS

The purpose of this Appendix is to illustrate the decline in total production costs with succeeding field increases from expensive pre-nuclear seed stock through the nuclear generations. The analysis presented points to the relative importance of various factors in the determination of these costs and provides some preliminary guidelines for the relationship between the prices of seed generations at the Porter Farm.

Assume a generational production process beginning with pre-nuclear propagules consisting of either mini-tubers or plantlets. These are then field grown through succeeding generations designated as Nuclear 1 through Nuclear 4 (N1 - N4). Assume also:

1. that the production costs other than seed costs are $4000/acre for N1 production and $2000/acre thereafter,

2. propagules are planted in 10 in spacing, using 17,000 propagules per acre,

3. N1 seed and succeeding generations are planted at a rate of 30 cwt./acre,

and

4. seed costs for generations N2-N4 are treated as the accumulated average cost (per cwt.) of the preceding generations.

Since there has been no recent study of the costs of producing seed potatoes in Maine, the figures used here are approximations that are deliberately quite conservative. Because these costs will vary from operation to operation and from year to year, estimates based on a range of costs are provided. Per acre production costs, other than

seed costs, have only a minor effect on the costs per cwt. of generations N2-N4 so there is no variation of these performed here. Tissue culture yields, field increase rates and the price of propagules are varied for analysis.

Propagule yields (pounds of N1/minituber or plantlet) at the Porter Farm have averaged about .25 lb./propagule, a rate that is considered to be low. Private growers have reported yields up to more than 2#/propagule. We consider yields varying from 0.25#/propagule up to 1.5#/propagule.

For generations N2 through N4, increase rates vary from 8 to 12 (pounds per pound of seed) and are generally thought to be about 10, but varying from year to year and among varieties. We have considered increase rates of 8, 10 and 12.

The current price of tissue culture products at the Porter Farm is $0.75/propagule. This price is very likely to be substantially less than the costs of producing these propagules. Market prices for these vary widely. The Uihlein Farm in New York charges $1.67 or more. Recently, a quantity of specially treated mini-tubers at the Porter Farm was sold at a price of $2.50/mini-tuber, based on an estimate of the cost. We vary propagule prices from $0.75 to $2.50/propagule.

Tables B1 through B5 report the results of this analysis. The figures in each row of the Tables represent the total cost per cwt. of producing each generation under the indicated assumptions. For example, the first row of Table B1 indicates that with the costs assumed above, with yields of 0.25/propagule, an increase factor of 8 and a $0.75 cost of propagules, the total cost of producing the N1 generation is about $197/cwt, the cost of N2 is about $33/cwt., etc.

The important implication of this analysis is apparent, the rapid decline in costs per cwt. in succeeding generations. The highest cost scenario (Table B1) is with a 0.25#/propagule yield, an 8-fold field increase and a $2.50/unit propagule cost. Under this scenario, the cost of producing the N1 generation would be about $1100/cwt. This high cost declines rapidly to about $145/cwt. for N2, $26.50/cwt. for N3 and $11.50/cwt for N4. The lowest cost scenario (Table B5) is with a 1.5#/propagule yield, a 12-fold field increase and a $.75/unit propagule cost. Under this scenario, the cost of producing the N1 generation would be less than about $66/cwt, then falls to about $11/cwt. for N2, and is less than $6.50/cwt. for N3 and N4. Figure B1 presents these two cases graphically.

The current Porter Farm prices are $35/cwt. for N2 seed, $29/cwt. for N3, and $26/cwt for N4. Even with the very high costs of the N1 generation, the costs of the N3 and N4 generations are lower than current Porter Farm prices in all 75 presented scenarios. N2 costs are less than the current Porter farm price of $35 in 28 of the 75 scenarios.

Are assumptions correct?

Table B1. Costs of N1-N4 Generations at Various Propagule Prices, By Increase Rate. (N1 Yield = 0.25 #/propagule)

Price	Cost of Generation ($/cwt.)			
$/Prop.	N1	N2	N3	N4
	8-fold Field Increase			
$0.75	$394.12	$57.60	$15.53	$10.27
1.00	494.12	70.10	17.10	10.47
1.50	694.12	95.10	20.22	10.86
2.00	894.12	120.10	23.35	11.25
2.50	1094.12	145.10	26.47	11.64
	10-fold Field Increase			
$0.75	$394.12	$46.08	$11.27	$7.79
1.00	494.12	56.08	12.27	7.89
1.50	694.12	76.08	14.27	8.09
2.00	894.12	96.08	16.27	8.29
2.50	1094.12	116.08	18.27	8.49
	12-fold Field Increase			
$0.75	$394.12	$38.40	$8.76	$6.29
1.00	494.12	46.73	9.45	6.34
1.50	694.12	63.40	10.84	6.46
2.00	894.12	80.07	12.23	6.57
2.50	1094.12	96.73	13.62	6.69

An alternate way to view the tables is to consider the later generation columns as market prices. With this view, the earlier generation columns can be considered as break even prices for the earlier generation. For example, in Table B1, with a 8-fold field increase and a $2.50 cost of propagules, the cost of the N3 generation is about $26.50/cwt. (slightly less than the current Porter Farm Price). At this market price producers would approximately break even if the N2 price to them were about $145/cwt. or if the N1 price were slightly less than $1200/cwt.

Table B2. **Costs of N1-N4 Generations at Various Propagule Prices, By Increase Rate. (N1 Yield = 0.5 #/propagule)**

Price	Cost of Generation ($/cwt.)			
$/Prop.	N1	N2	N3	N4
	8-fold Field Increase			
$0.75	$197.06	$32.97	$12.45	$9.89
1.00	247.06	39.22	13.24	9.99
1.50	347.06	51.72	14.80	10.18
2.00	447.06	64.22	16.36	10.38
2.50	547.06	76.72	17.92	10.57
	10-fold Field Increase			
$0.75	$197.06	$26.37	$9.30	$7.60
1.00	247.06	31.37	9.80	7.65
1.50	347.06	41.37	10.80	7.75
2.00	447.06	51.37	11.80	7.85
2.50	547.06	61.37	12.80	7.95
	12-fold Field Increase			
$0.75	$197.06	$21.98	$7.39	$6.17
1.00	247.06	26.14	7.73	6.20
1.50	347.06	34.48	8.43	6.26
2.00	447.06	42.81	9.12	6.32
2.50	547.06	51.14	9.82	6.37

Table B3. Costs of N1-N4 Generations at Various Propagule Prices, By Increase Rate. (N1 Yield = 0.75#/propagule)

Price	Cost of Generation ($/cwt.)			
$/Prop.	N1	N2	N3	N4
	8-fold Field Increase			
$0.75	$131.37	$24.75	$11.43	$9.76
1.00	164.71	28.92	11.95	9.83
1.50	231.37	37.25	12.99	9.96
2.00	298.04	45.59	14.03	10.09
2.50	364.71	53.92	15.07	10.22
	10-fold Field Increase			
$0.75	$131.37	$19.80	$8.65	$7.53
1.00	164.71	23.14	8.98	7.56
1.50	231.37	29.80	9.65	7.63
2.00	298.04	36.47	10.31	7.70
2.50	364.71	43.14	10.98	7.76
	12-fold Field Increase			
$0.75	$131.37	$16.50	$6.93	$6.13
1.00	164.71	19.28	7.16	6.15
1.50	231.37	24.84	7.63	6.19
2.00	298.04	30.39	8.09	6.23
2.50	364.71	35.95	8.55	6.27

Table B4. Costs of N1-N4 Generations at Various Propagule Prices, By Increase Rate. (N1 Yield = 1#/propagule)

Price	Cost of Generation ($/cwt.)			
$/Prop.	N1	N2	N3	N4
	8-fold Field Increase			
$0.75	$98.53	$20.65	$10.91	$9.70
1.00	123.53	23.77	11.31	9.75
1.50	173.53	30.02	12.09	9.84
2.00	223.53	36.27	12.87	9.94
2.50	273.53	42.52	13.65	10.04
	10-fold Field Increase			
$0.75	$98.53	$16.52	$8.32	$7.50
1.00	123.53	19.02	8.57	7.52
1.50	173.53	24.02	9.07	7.57
2.00	223.53	29.02	9.57	7.62
2.50	273.53	34.02	0.07	7.67
	12-fold Field Increase			
$0.75	$98.53	$13.77	$6.70	$6.11
1.00	123.53	15.85	6.88	6.13
1.50	173.53	20.02	7.22	6.16
2.00	223.53	24.18	7.57	6.19
2.50	273.53	28.35	7.92	6.22

Table B5. Costs of N1-N4 Generations at Various Propagule Prices, By Increase Rate. (N1 Yield = 1.5#/propagule)

Price	Cost of Generation ($/cwt.)			
$/Prop.	N1	N2	N3	N4
	8-fold Field Increase			
$0.75	$65.69	$16.54	$10.40	$9.63
1.00	82.35	18.63	10.66	9.67
1.50	115.69	22.79	11.18	9.73
2.00	149.02	26.96	11.70	9.80
2.50	182.35	31.13	12.22	9.86
	10-fold Field Increase			
$0.75	$65.69	$13.24	$7.99	$7.47
1.00	82.35	14.90	8.16	7.48
1.50	115.69	18.24	8.49	7.52
2.00	149.02	21.57	8.82	7.55
2.50	182.35	24.90	9.16	7.58
	12-fold Field Increase			
$0.75	$65.69	$11.03	$6.47	$6.10
1.00	82.35	12.42	6.59	6.10
1.50	115.69	15.20	6.82	6.12
2.00	149.02	17.97	7.05	6.14
2.50	182.35	20.75	7.28	6.16

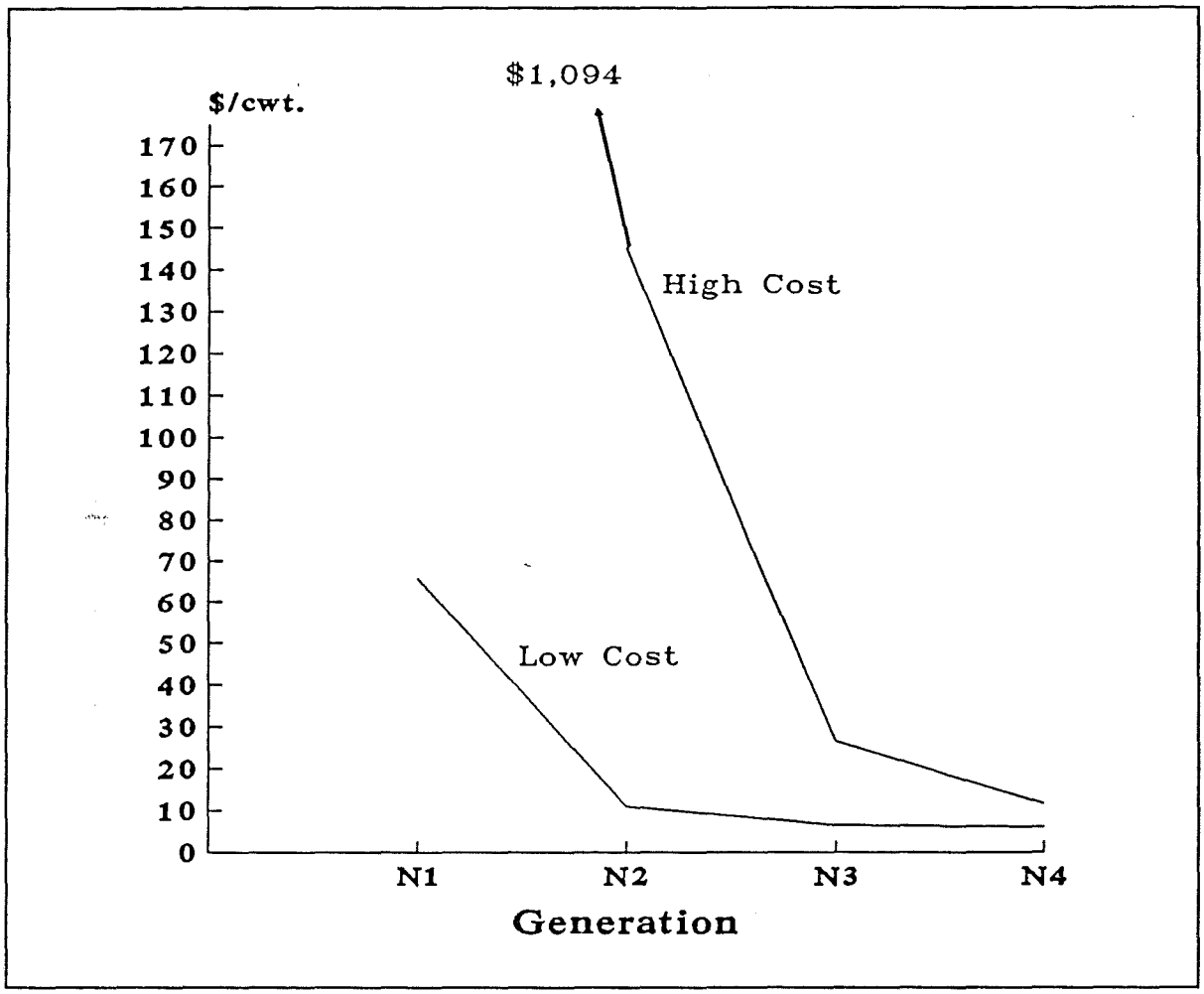

Figure B1: Total Cost of Producing Seed Potatoes, By Nuclear Generation.

High Cost indicates a 0.25#/propagule yield, an 8-fold field increase and a $2.50/unit propagule cost.

Low Cost indicates a 1.5#/propagule yield, a 12-fold field increase and a $.75/unit propagule cost.

APPENDIX C

MSPB FINANCIAL STATEMENTS

MAINE DEPARTMENT OF AGRICULTURE, FOOD & RURAL RESOURCES
MAINE SEED POTATO BOARD
744 Main Street, Suite 3
Presque Isle, Maine 04769

anuary 28, 1991

Anticipated Income - FY 1991

		@$26	@$28
eed sales			
16,000 cwt		$416,000	$448,000
17,000 cwt		442,000	476,000
	≈ $425,000		
FL test			
samples		$130,830	
land rent--	Canada (36)	61,200	
	Michigan (4.5)	7,650	
land rent -	Borek	10,000	
NE 107 - seed sales		3,000	
ARS - Cooperative agreement		25,000	
Laboratory/greenhouse sales			
Plantlets			
Monsanto		20,000	
Maxwell		6,000	
Minitubers			
Eagle Snacks		1,500	
Vayda - UMO		750	
Monsanto		3,500	
Berce		750	
N1 production			
Monsanto		15,000	
		$710,180	

MAINE SEED POTATO BOARD
BUDGET VS ACTUAL
AS OF FEB 28, 1991

BEGINNING BALANCE JULY 1, 1990		59,622	59,622	
CASH RECEIVED				
	ACTUAL		BUDGET	% ACHIEVED
NON-REVENUE RECEIPTS				
Fed Grnt - Lab Advance	110,580		110,580	100%
ARS Grant - Lab	17,169		40,000	43%
ARS Grant - Roguing	11,331		3,500	324%
General Fund Transfer	245,000		245,000	100%
General Fund Wrkng Cap Adv	175,000		175,000	100%
Reimb Ovrchrg-Emp Hlth FY88	467		0	
Credit on Prior Year Trans	172		0	
Total Non-Revenue Rcpts	559,719		574,080	97%
REVENUE RECEIPTS				
Sale of Seed	11,134		488,000	2%
Seed Contracts 1991	10,520		0	
Florida Testing	131,120		130,830	100%
Florida Test Refunds	(590)		0	
Florida - Land Rent	38,250		78,850	49%
Interest on Cash Balance	4,245		0	
Misc Income	3,696		47,500	8%
Total Revenue	198,675		745,180	27%
TOTAL RECEIVED		758,394	1,319,260	57%
EXPENDITURES				
PERSONAL SERVICES				
3100 Salaries	212,163		314,551	67%
3180 Vacation Pay	470		0	
3611 Standard OT	1,226		2,000	61%
3612 Premium OT	30,263		39,764	76%
3616 Retro-Lump Sum	2,854		2,854	100%
3631 Longevity	1,696		2,024	84%
3810 Unemployment	477		940	51%
3901 Blue Cross	29,382		43,443	68%
3905 Dental Ins	1,499		2,229	67%
3906 Employee Health Servic	471		896	53%
3910 Retirement	49,201		70,577	70%
3911 Life Ins	722		1,055	68%
3912 Medicare	1,265		1,728	73%
Total Personal Services		331,690	482,061	69%

ALL OTHER				
4000 Prof Serv(Not State)	48,873		60,000	81%
4100 Prof Serv/By State	325		0	
4200 Travel/In-State	1,639		5,000	33%
4300 Travel/Out-of-State	19,131		25,000	77%
4400 Oper State Vehicles	16,757		20,000	84%
4500 Utilities	19,946		60,000	33%
4600 Rents	5,640		14,000	40%
4700 Repairs	43,603		55,000	79%
4800 Insurance	5,112		6,000	85%
4900 General Operating Exp	18,223		24,000	76%
5100 Food	436		2,000	22%
5200 Fuel	10,520		20,000	53%
5300 Office Supplies	678		3,000	23%
5400 Clothing	2,886		4,000	72%
5600 Other Supplies	144,440		250,000	58%
6300 Grants to Cities	0		7,500	0%
6900 Med & Workers Comp	684		2,000	34%
8000 Finance Charges	232		1,000	23%
8511 Sta-Cap	10,087		20,000	50%
Total All Other		349,212	578,500	60%
LAB CONSTRUCTION	115,399	115,399	130,000	89%
CAPITAL EXPENDITURES				
7100 Buildings & Improv	0		0	
7200 Equipment	6,418		10,000	64%
7300 Structures & Improv	0		0	
Total Capital Exp		6,418	10,000	64%
REPAYMENT OF WORKING CAP ADV	0		175,000	
TOTAL EXPENDITURES & CAPITAL		802,719	1,375,561	58%
NET INCOME		(44,325)	(56,301)	
AVAILABLE CASH FEB 28, 1991		15,297	3,321	

MAINE SEED POTATO BOARD
5 YEAR EXP COMPARISON
AS OF FEB 28, 1991

OBJT DISCRIPTION	ACTUAL FY87	ACTUAL FY88	ACTUAL FY89	ACTUAL FY90	ESTIMATED FY91	ACTUAL YR TO DATE	EST. BAL FY91
PERSONAL SERVICES							
3100 SALARY	237,237	265,834	262,434	306,283	314,551	212,163	102,388
3180 VACATION PAY	0	0	0	2,236	0	470	(470)
3611 STANDARD OVERTIME	3,872	3,428	2,563	1,657	2,000	1,226	774
3612 PREMIUM OVERTIME	45,251	41,322	40,830	43,051	39,764	30,263	9,501
3616 RETRO LUMP SUM	5,304	2,229	0	1,496	2,854	2,854	0
3631 LONGEVITY INCREASE	0	0	0	880	2,024	1,696	328
3810 UNEMPLOYMENT COMP	2,844	2,968	1,994	2,221	940	477	463
3901 HEALTH INSURANCE	16,320	21,743	25,127	35,444	43,443	29,382	14,061
3902 MEDICARE REIMB	0	0	62	0	0	0	0
3905 DENTAL INSURANCE	1,163	1,298	2,039	2,311	2,229	1,499	730
3906 EMPLOYEE HEALTH SERV	0	940	849	797	896	471	425
3910 RETIREMENT	49,510	57,320	57,709	68,503	70,577	49,201	21,376
3911 GROUP LIFE INS.	797	904	898	1,032	1,055	722	333
3912 MEDICARE COSTS	548	1,101	1,155	1,953	1,728	1265	463
TOTAL PERSONAL SERV	362,846	399,137	395,660	467,863	482,061	331,690	149,908
ALL OTHER							
4000 PROF SERV/NOT STATE	55,585	74,728	85,490	62,854	60,000	48,873	11,127
4100 PROF SERV/BY STATE	825	0	0	0	0	325	(325)
4200 TRAVEL/IN STATE	6,586	4,704	14,525	6,248	5,000	1,639	3,361
4300 TRAVEL/OUT OF STATE	23,276	32,029	21,192	19,014	25,000	19,131	5,869
4400 OPER STATE VEHICLE	14,810	8,726	39,553	16,855	20,000	16,757	3,243
4500 UTILITIES	38,697	32,744	42,111	50,655	60,000	19,946	40,054
4600 RENT	12,178	5,712	11,256	13,581	14,000	5,640	8,360
4700 REPAIRS	34,192	42,467	39,598	48,296	55,000	43,603	11,397
4800 INSURANCE	2,925	4,092	4,893	5,555	6,000	5,112	888
4900 GENERAL OPERATING EXP	29,975	15,066	22,084	20,181	24,000	18,223	5,777
5100 FOOD	712	1,118	1,409	1,584	2,000	436	1,564
5200 FUEL	4,181	20,552	15,063	16,395	20,000	10,520	9,480
5300 OFFICE SUPPLIES	2,950	3,081	3,222	1,892	3,000	678	2,322
5400 CLOTHING	3,356	1,979	3,402	4,965	4,000	2,886	1,114
5600 OTHER SUPPLIES	195,106	127,753	252,084	246,410	250,000	144,440	105,560
6300 GRANTS TO CITIES	10,682	2,500	0	0	7,500	0	7,500
6900 MED & WORKERS COMP	785	39,665	11,360	3,130	2,000	684	1,316
8000 LATE PAYMENTS	145	396	1,707	309	1,000	232	768
8511 STA-CAP	26,210	21,536	9,120	6,616	20,000	10,087	9,913
TOTAL ALL OTHER	463,176	438,848	578,069	524,540	578,500	349,212	229,288
CAPITOL							
7100 BUILDINGS & IMPROV.	2,214	5,050	50,919	0	130,000	115,399	14,601
7200 EQUIPMENT	5,399	25,931	89,222	33,858	0	0	0
7300 STRUCTURES & IMPROV.	0	4,211	29,607	0	10,000	6,418	3,582
TOTAL CAPITAL	7,613	35,192	169,748	33,858	140,000	121,817	18,183
GRAND TOTAL	833,635	873,177	1,143,477	1,026,261	1,200,561	802,719	397,379

MAINE SEED POTATO BOARD
BUDGET VS ACTUAL
AS OF MAR 31, 1991

BEGINNING BALANCE JULY 1, 1990		59,622	59,622	
CASH RECEIVED				
	ACTUAL		BUDGET	% ACHIEVED
NON-REVENUE RECEIPTS				
Fed Grnt - Lab Advance	110,580		110,580	100%
ARS Grant - Lab	17,169		40,000	43%
ARS Grant - Roguing	11,331		3,500	324%
General Fund Transfer	245,000		245,000	100%
General Fund Wrkng Cap Adv	175,000		175,000	100%
Reimb Ovrchrg-Emp Hlth FY88	467		0	
Credit on Prior Year Trans	1,328		0	
Total Non-Revenue Rcpts	560,875		574,080	98%
REVENUE RECEIPTS				
Sale of Seed	11,561		488,000	2%
Seed Contracts 1991	14,002		0	
Florida Testing	131,140		130,830	100%
Florida Test Refunds	(590)		0	
Florida - Land Rent	68,850		78,850	87%
Interest on Cash Balance	4,314		0	
Misc Income	3,696		47,500	8%
Total Revenue	232,974		745,180	31%
TOTAL RECEIVED		793,849	1,319,260	60%
EXPENDITURES				
PERSONAL SERVICES				
3100 Salaries	239,664		314,551	76%
3180 Vacation Pay	470		0	
3611 Standard OT	1,226		2,000	61%
3612 Premium OT	30,263		39,764	76%
3616 Retro-Lump Sum	2,854		2,854	100%
3631 Longevity	1,696		2,024	84%
3810 Unemployment	477		940	51%
3901 Blue Cross	33,002		43,443	76%
3905 Dental Ins	1,685		2,229	76%
3906 Employee Health Servic	471		896	53%
3910 Retirement	54,712		70,577	78%
3911 Life Ins	807		1,055	77%
3912 Medicare	1,402		1,728	81%
Total Personal Services		368,731	482,061	76%

	ACTUAL		BUDGET	% ACHIEVED
ALL OTHER				
4000 Prof Serv(Not State)	48,873		60,000	81%
4100 Prof Serv/By State	325		0	
4200 Travel/In-State	1,639		5,000	33%
4300 Travel/Out-of-State	19,131		25,000	77%
4400 Oper State Vehicles	16,757		20,000	84%
4500 Utilities	24,302		60,000	41%
4600 Rents	5,640		14,000	40%
4700 Repairs	43,603		55,000	79%
4800 Insurance	5,112		6,000	85%
4900 General Operating Exp	18,830		24,000	78%
5100 Food	436		2,000	22%
5200 Fuel	10,520		20,000	53%
5300 Office Supplies	678		3,000	23%
5400 Clothing	2,886		4,000	72%
5600 Other Supplies	144,440		250,000	58%
6300 Grants to Cities	0		7,500	0%
6900 Med & Workers Comp	684		2,000	34%
8000 Finance Charges	232		1,000	23%
8511 Sta-Cap	10,087		20,000	50%
Total All Other		354,176	578,500	61%
LAB CONSTRUCTION	115,399	115,399	130,000	89%
CAPITAL EXPENDITURES				
7100 Buildings & Improv	0		0	
7200 Equipment	6,418		10,000	64%
7300 Structures & Improv	0		0	
Total Capital Exp		6,418	10,000	64%
REPAYMENT OF WORKING CAP ADV	0		175,000	
TOTAL EXPENDITURES & CAPITAL		844,724	1,375,561	61%
NET INCOME		(50,875)	(56,301)	
AVAILABLE CASH MAR 31, 1991		8,747	3,321	

MAINE SEED POTATO BOARD
BUDGET VS ACTUAL*
PROJECTION FOR JUNE 30, 1991

BEGINNING BALANCE JULY 1, 1990		59,622	59,622	
CASH RECEIVED				
	ACTUAL		BUDGET	% ACHIEVED
NON-REVENUE RECEIPTS				
Fed Grnt - Lab Advance	110,580		110,580	100%
ARS Grant - Lab	40,000		40,000	100%
ARS Grant - Roguing	11,331		3,500	324%
General Fund Transfer	245,000		245,000	100%
General Fund Wrkng Cap Adv	175,000		175,000	100%
Reimb Ovrchrg-Emp Hlth FY88	467		0	
Credit on Prior Year Trans	172		0	
Total Non-Revenue Rcpts	582,550		574,080	101%
REVENUE RECEIPTS				
Sale of Seed	488,000		488,000	100%
Seed Contracts 1991	10,520		0	
Florida Testing	131,120		130,830	100%
Florida Test Refunds	(590)		0	
Florida - Land Rent	78,850		78,850	100%
Interest on Cash Balance	4,245		0	
Misc Income	47,500		47,500	100%
Total Revenue	759,645		745,180	102%
TOTAL RECEIVED		1,342,195	1,319,260	102%
EXPENDITURES				
PERSONAL SERVICES				
3100 Salaries	313,223		314,551	100%
3180 Vacation Pay	470		0	
3611 Standard OT	1,577		2,000	79%
3612 Premium OT	43,048		39,764	108%
3616 Retro-Lump Sum	2,969		2,854	104%
3631 Longevity	2,224		2,024	110%
3810 Unemployment	1,971		940	210%
3901 Blue Cross	42,158		43,443	97%
3905 Dental Ins	2,269		2,229	102%
3906 Employee Health Servic	876		896	98%
3910 Retirement	71,239		70,577	101%
3911 Life Ins	1,053		1,055	100%
3912 Medicare	1,905		1,728	110%
Total Personal Services		484,984	482,061	101%

	ACTUAL		BUDGET	% ACHIEVED
ALL OTHER				
4000 Prof Serv(Not State)	71,713		60,000	120%
4100 Prof Serv/By State	325		0	
4200 Travel/In-State	4,703		5,000	94%
4300 Travel/Out-of-State	19,531		25,000	78%
4400 Oper State Vehicles	21,036		20,000	105%
4500 Utilities	40,163		60,000	67%
4600 Rents	11,312		14,000	81%
4700 Repairs	58,289		55,000	106%
4800 Insurance	5,249		6,000	87%
4900 General Operating Exp	27,916		24,000	116%
5100 Food	436		2,000	22%
5200 Fuel	17,341		20,000	87%
5300 Office Supplies	1,748		3,000	58%
5400 Clothing	4,107		4,000	103%
5600 Other Supplies	248,662		250,000	99%
6300 Grants to Cities	0		7,500	0%
6900 Med & Workers Comp	782		2,000	39%
8000 Finance Charges	346		1,000	35%
8511 Sta-Cap	11,975		20,000	60%
Total All Other		545,635	578,500	94%
LAB CONSTRUCTION	130,399	130,399	130,000	100%
CAPITAL EXPENDITURES				
7100 Buildings & Improv	0		0	
7200 Equipment	22,198		10,000	222%
7300 Structures & Improv	0		0	
Total Capital Exp		22,198	10,000	222%
REPAYMENT OF WORKING CAP ADV	175,000	175,000	175,000	
TOTAL EXPENDITURES & CAPITAL		1,358,216	1,375,561	99%
NET INCOME		(16,021)	(56,301)	
AVAILABLE CASH FEB 28, 1991		43,601	3,321	

*ACTUAL EXP ARE YTD EXP AS OF MARCH 1991 PLUS ATTACHED ESTIMATED EXPENDITURES FOR APRIL, MAY, & JUNE

MAINE SEED POTATO BOARD
ESTIMATED EXPENDITURES FOR REMAINDER OF FY91

	MARCH 1991	APRIL 1991	MAY 1991	JUNE 1991
PERSONAL SERVICES				
3100 Salaries	27,501.21	23,761.00	26,490.00	23,308.00
3180 Vacation Pay	0.00	0.00	0.00	0.00
3611 Standard OT	0.00	101.00	122.00	128.00
3612 Premium OT	0.00	2,943.00	5,545.00	4,297.00
3616 Retro-Lump Sum	0.00	0.00	115.00	0.00
3631 Logevity	0.00	176.00	176.00	176.00
3810 Unemployment	0.00	0.00	1,494.00	0.00
3901 Blue Cross	3,620.22	3,060.00	3,118.00	2,978.00
3905 Dental Ins	185.74	199.00	199.00	186.00
3906 Employee Health Srv	0.00	405.00	0.00	0.00
3910 Retirement	5,511.23	5,259.00	5,862.00	5,406.00
3911 Life Ins	85.02	83.00	85.00	78.00
3912 Medicare	137.42	151.00	206.00	146.00
Total Personal Services	37,040.84	36,138.00	43,412.00	36,703.00
ALL OTHER				
4000 Prof Serv(Not State)	0.00	5,032.00	10,035.00	7,773.00
4100 Prof Serv/By State	0.00	0.00	0.00	0.00
4200 Travel/In-State	0.00	435.00	2,531.00	98.00
4300 Travel/Out-of-State	0.00	0.00	400.00	0.00
4400 Oper State Vehicles	0.00	921.00	2,429.00	929.00
4500 Utilities	4,356.05	7,640.00	3,972.00	4,249.00
4600 Rents	0.00	521.00	462.00	4,689.00
4700 Repairs	0.00	6,784.00	4,861.00	3,041.00
4800 Insurance	0.00	137.00	0.00	0.00
4900 General Operating Exp	607.75	4,675.00	3,200.00	1,211.00
5100 Food	0.00	0.00	0.00	0.00
5200 Fuel	0.00	4,349.00	1,893.00	579.00
5300 Office Supplies	0.00	550.00	390.00	130.00
5400 Clothing	0.00	437.00	159.00	625.00
5600 Other Supplies	0.00	32,838.00	27,743.00	43,641.00
6300 Grants to Cities	0.00	0.00	0.00	0.00
6900 Med & Workers Comp	0.00	68.00	30.00	0.00
8000 Finance Charges	0.00	60.00	48.00	6.00
8511 Sta-Cap	0.00	540.00	924.00	424.00
Total All Other	4,963.80	64,987.00	59,077.00	67,395.00
LAB CONSTRUCTION	0.00	5,000.00	5,000.00	5,000.00
CAPITOL EXPENDITURES				
7100 Buildings & Improv	0.00	0.00	0.00	0.00
7200 Equipment	0.00	13,502.00	2,278.00	0.00
7300 Structures & Improv	0.00	0.00	0.00	0.00
Total Capitol Exp	0.00	13,502.00	2,278.00	0.00
TOTAL EXPENDITURES	42,004.64	114,627.00	104,767.00	104,098.00

BASED ON ACTUAL EXPENDITURES FOR MAR, APR, MAY, & JUN IN FY90

DATE: APR 29, 1991

TO: Maine Seed Potato Board DEPT: Agriculture

FROM: Debra Wadleigh, Acct II DEPT: Agriculture

RE: Updated Budget vs Actual Projection for June 30, 1991

At last months Seed Board Meeting you recieved an Budget vs Actual Projection for June 30, 1991. Other changes that will effect the final profit or loss figure have since come to my attention. In order to give you a more accurate projection, I have incorporated the following changes into this report:

ORIGINAL LOSS	(16,021.00)
Reduced Est of Seed Sales	(38,000.00)
Gen Fnd Position Trans to MSPB	(10,238.06)
Mar Inv Held until April	(67,361.01)*
FY90 Mar Exp Removed From Apr	40,259.00 *
Replace Est Mar Exp with Actual	(694.34)
Adjust for 3% Pay Raise in April	(1,012.52)
LOSS AFTER AJUSTMENTS	(93,067.93)

* Orginally I used Mar FY90 as an est of Mar FY91 exp, but the invoices being held were considerably higher. In order to produce a more accurate report, I have backed out the Mar Fy90 exp. added to April and replaced them with the amount of the actual invoices currently being held.

MAINE SEED POTATO BOARD
BUDGET VS EST ACTUAL*
PROJECTION FOR JUNE 30, 1991

BEGINNING BALANCE JULY 1, 1990		59,622	59,622	
CASH RECEIVED				
	ACTUAL		BUDGET	% ACHIEVED
NON-REVENUE RECEIPTS				
Fed Grnt - Lab Advance	110,580		110,580	100%
ARS Grant - Lab	40,000		40,000	100%
ARS Grant - Roguing	11,331		3,500	324%
General Fund Transfer	245,000		245,000	100%
General Fund Wrkng Cap Adv	175,000		175,000	100%
Reimb Ovrchrg-Emp Hlth FY88	467		0	
Credit on Prior Year Trans	172		0	
Total Non-Revenue Rcpts	582,550		574,080	101%
REVENUE RECEIPTS				
Sale of Seed	450,000		488,000	92%
Seed Contracts 1991	10,520		0	
Florida Testing	131,120		130,830	100%
Florida Test Refunds	(590)		0	
Florida - Land Rent	78,850		78,850	100%
Interest on Cash Balance	4,245		0	
Misc Income	47,500		47,500	100%
Total Revenue	721,645		745,180	97%
TOTAL RECEIVED		1,304,195	1,319,260	99%
EXPENDITURES				
PERSONAL SERVICES				
3100 Salaries	320,238		314,551	102%
3180 Vacation Pay	470		0	
3611 Standard OT	1,974		2,000	99%
3612 Premium OT	45,792		39,764	115%
3616 Retro-Lump Sum	2,969		2,854	104%
3631 Longevity	2,464		2,024	122%
3810 Unemployment	1,971		940	210%
3901 Blue Cross	42,657		43,443	98%
3905 Dental Ins	2,296		2,229	103%
3906 Employee Health Servic	876		896	98%
3910 Retirement	71,537		70,577	101%
3911 Life Ins	1,084		1,055	103%
3912 Medicare	1,905		1,728	110%
Total Personal Services		496,234	482,061	103%

	ACTUAL		BUDGET	% ACHIEVED
ALL OTHER				
4000 Prof Serv(Not State)	69,471		60,000	116%
4100 Prof Serv/By State	325		0	
4200 Travel/In-State	4,472		5,000	89%
4300 Travel/Out-of-State	19,531		25,000	78%
4400 Oper State Vehicles	20,221		20,000	101%
4500 Utilities	35,900		60,000	60%
4600 Rents	10,791		14,000	77%
4700 Repairs	53,087		55,000	97%
4800 Insurance	5,249		6,000	87%
4900 General Operating Exp	24,569		24,000	102%
5100 Food	436		2,000	22%
5200 Fuel	14,078		20,000	70%
5300 Office Supplies	1,379		3,000	46%
5400 Clothing	3,670		4,000	92%
5600 Other Supplies	229,645		250,000	92%
6300 Grants to Cities	0		7,500	0%
6900 Med & Workers Comp	782		2,000	39%
8000 Finance Charges	286		1,000	29%
8511 Sta-Cap	12,178		20,000	61%
MAR INV HELD UNTIL APRIL	67,361			
Total All Other		573,431	578,500	99%
LAB CONSTRUCTION	130,399	130,399	130,000	100%
CAPITAL EXPENDITURES				
7100 Buildings & Improv	0		0	
7200 Equipment	22,198		10,000	222%
7300 Structures & Improv	0		0	
Total Capital Exp		22,198	10,000	222%
REPAYMENT OF WORKING CAP ADV	175,000	175,000	175,000	
TOTAL EXPENDITURES & CAPITAL		1,397,262	1,375,561	102%
NET INCOME (LOSS)		(93,067)	(56,301)	
AVAILABLE CASH JUNE 30, 1991		(33,445)	3,321	

*ACTUAL EXP ARE YTD EXP AS OF MARCH 1991 PLUS ATTACHED ESTIMATED EXPENDITURES FOR APRIL, MAY, & JUNE

MAINE SEED POTATO BOARD
ESTIMATED EXPENDITURES FOR REMAINDER OF FY91

	APRIL 1991	MAY 1991	JUNE 1991
PERSONAL SERVICES			
3100 Salaries	25,897.04	28,707.91	25,430.45
3180 Vacation Pay	0.00	0.00	0.00
3611 Standard OT	101.00	122.00	128.00
3612 Premium OT	2,943.00	5,545.00	4,297.00
3616 Retro-Lump Sum	0.00	115.00	0.00
3631 Logevity	176.00	176.00	176.00
3810 Unemployment	0.00	1,494.00	0.00
3901 Blue Cross	3,060.00	3,118.00	2,978.00
3905 Dental Ins	199.00	199.00	186.00
3906 Employee Health Srv	405.00	0.00	0.00
3910 Retirement	5,189.77	5,753.07	5,096.26
3911 Life Ins	88.72	90.72	83.72
3912 Medicare	151.00	206.00	146.00
Total Personal Services	38,210.53	45,526.70	38,521.43
ALL OTHER			
4000 Prof Serv(Not State)	2,790.00	10,035.00	7,773.00
4100 Prof Serv/By State	0.00	0.00	0.00
4200 Travel/In-State	204.00	2,531.00	98.00
4300 Travel/Out-of-State	0.00	400.00	0.00
4400 Oper State Vehicles	55.00	2,429.00	929.00
4500 Utilities	3,377.00	3,972.00	4,249.00
4600 Rents	0.00	462.00	4,689.00
4700 Repairs	1,582.00	4,861.00	3,041.00
4800 Insurance	137.00	0.00	0.00
4900 General Operating Exp	1,427.00	3,200.00	1,211.00
5100 Food	0.00	0.00	0.00
5200 Fuel	1,086.00	1,893.00	579.00
5300 Office Supplies	181.00	390.00	130.00
5400 Clothing	0.00	159.00	625.00
5600 Other Supplies	13,821.00	27,743.00	43,641.00
6300 Grants to Cities	0.00	0.00	0.00
6900 Med & Workers Comp	68.00	30.00	0.00
8000 Finance Charges	0.00	48.00	6.00
8511 Sta-Cap	0.00	924.00	424.00
MAR EXP HELD UNTIL APR	67,361.01		
Total All Other	92,089.01	59,077.00	67,395.00
LAB CONSTRUCTION	5,000.00	5,000.00	5,000.00
CAPITOL EXPENDITURES			
7100 Buildings & Improv	0.00	0.00	0.00
7200 Equipment	13,502.00	2,278.00	0.00
7300 Structures & Improv	0.00	0.00	0.00
Total Capitol Exp	13,502.00	2,278.00	0.00
TOTAL EXPENDITURES	143,801.54	106,881.70	105,916.43

BASED ON ACTUAL EXPENDITURES FOR APR, MAY, & JUN IN FY90