



AgEcon SEARCH

RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

Staff Papers Series

P86-9

January 1986

POTATO PRODUCTION AND STORAGE COST
ESTIMATES FOR MINNESOTA IN 1986

by

Fred J. Benson

and

Duane A. Preston



Department of Agricultural and Applied Economics

University of Minnesota
Institute of Agriculture, Forestry and Home Economics
St. Paul, Minnesota 55108

Potato Production and Storage Cost

Estimates for Minnesota in 1986

by

Fred J. Benson

and

Duane A. Preston

Department of Agricultural and Applied Economics
University of Minnesota

January 1986

INTRODUCTION

It appears that overall production costs will decrease from last year with no increase in prices expected at this time. This year, it appears that the new prices of machinery are down slightly, but with discounts of up to 30 percent available on new machinery. Usually we calculate machinery use costs with a built in discount of 6 to 8 percent by using list prices on new machinery. There are costs that are normally incurred such as transportation, set-up charges and sales tax. Our assumption was that transportation, set-up charges and sales tax were offset by the discount a purchaser could normally receive. This year we increased the discount a purchaser of new machinery could bargain for by considering an additional 15 percent off of list price. The costs used this year then represent a 21 to 23 percent decrease in ownership costs of machinery. Repairs and maintenance costs are calculated using the list prices, and because there is a slight reduction in new list prices, repair and maintenance costs are down slightly from last year.

Fertilizer costs are about the same as last year, but with signs of softening. Interest rates are the same as last year at this time for operating credit, but interest costs were reduced to 12 percent for machinery ownership costs.

Discussion of Budget Information

Potato crop production estimates shown in Appendix Tables 1 through 5 are developed for the Red River Valley. The reader should keep in mind that these budgets are projections and are subject to the many variables and uncertainties that can take place before and while the 1986 crop is produced and marketed. The yields used in the budgets are estimated using previous production records and the expectations of the farmers who provided us their production information.

Expected Prices: The hardest variable to estimate is that of price. These budgets are set up as production budgets. They do not contain storage costs. Therefore, the price used in the budgets is an expected harvest price. This allows the grower to separate the decision of what to grow from that of when and how to market.

Mid-winter projections of cash market prices for the 1986 crop are highly conjectural. The crop isn't planted. Acreage and yields are unknown. An individual's planting decisions should consider both the level of price expectations and the degree of confidence in those price expectations. Other competing crops may influence potato acreage and the factors affecting these crops are conjecture at this time, but need to be considered in the planning process. All of these variables must be considered and analyzed as best as possible to estimate the resulting impact on potato production acreage and expected prices.

The price forecasts used in the budgets are to provide a benchmark with which to assess harvest price potential as the season unfolds. They are built on crop carryover estimates in December 1985, on possible planted acreage and an estimate of crop yield. As planting time approaches, growers will refine these price estimates and compare the expected net returns from potatoes with other pricing alternatives and other crop production possibilities.

Cropping Costs and Cash Flow Expenses: The per acre costs (shown in the budgets) are developed on the basis of commercial production. Field performance rates are also indicated for the machine sizes given. Field operations are assumed to be done in a timely fashion. Cash flow expenses of field operations include diesel fuel, plus an allowance for lubrication and use-related repairs. Performance rates include discounts for the usual efficiency factors which account for turning time at the ends and other delays in field performance.

This year in our annual discussions with growers, we learned that many will watch their inputs very closely. Indications are that they are going to more closely monitor fertilizer and pesticide applications. The budgets are developed to show this change in production practices.

Machinery costs are included as "machinery function costs"--that is, the average total costs, on an annual basis, for the tractor and machine (overhead and operating) including operating labor to work one acre. The figure under the "Units of Applic" column indicates how many times it is used on one acre. The "Quantity" column is the time, in hours, required per acre--hours per acre. The figure in the "Price" column is the total cost to operate the tractor plus the machine, including labor for one hour. The "Total Amount" column is the result of multiplying the first three columns together. The "Cash Costs" column for a machine is the estimated value of fuel, oil and repairs for the tractor and implement. Labor costs are not included in cash costs. Fuel costs (diesel) are estimated to be \$1.00 per gallon.

Purchased Seed, Fertilizer and Chemicals: Other cost items indicate the number of units and the cost per unit. Quantities and rates indicated in the budgets are based upon recommended practices. Adjustments to individual farm conditions from these recommendations may be necessary. For instance, soil tests and fertilizer carryover from 1985 may suggest different fertilizer recommendations. Potassium and phosphate levels are approximately equal to removals adjusted for the availability of naturally available fertilizer ingredients in the soils.

Herbicide carryover considerations must be considered in terms of which crops are feasible on individual fields. Weed problems must also be considered. Specific chemicals used as herbicides and insecticides were grouped to attain a per acre cost.

Cash Expense Per Acre: Cash expenses are those costs associated specifically with the crop being considered and are incurred only with the production of that crop.

Costs indicated in the budgets are based on recommended practices for a good producer. Adjustments to individual farm conditions may be necessary with varying fertility situations, chemical use, and planning practices.

Cash costs estimate the out-of-pocket cash operating expenses and include estimates for fuel, oil, repairs, fertilizers, seed, chemicals, and land taxes. These costs are basic to any analysis of short-term adjustments to increase profitability.

In the short run, each grower seeks to maximize returns over cash costs. This, in turn, provides the greatest amount towards fixed assets, family living expenses and hired labor.

Land and Other Overhead Costs: The actual 1986 cash costs of renting land will vary greatly among individual operators due to varying land rental arrangements and land finance structures. This year we used a land charge representative of cash rental rates. Previously we broke land costs into a land charge which was an overhead cost, and land taxes which was a cash operating cost. Because of the confusion this seemed to create, we put the costs for land totally under land charge.

Labor is considered an overhead cost in the production process. This is the case with both operator and family labor and full-time hired labor. Special labor hired seasonally for a specific crop should be considered a cash cost. The budgets in the appendix tables assume the use of operator and family labor. Unskilled labor for tillage and truck driving is valued at \$5.20 per hour, and skilled labor for planting, spraying and harvesting is valued at \$8.50 per hour. These rates include a 30 percent charge over the wage rate to include workman's compensation, social security, insurance, and other employee benefits.

Crop Loss Costs (Insurance): The calculated crop loss cost can be viewed as either the cash expense of carrying crop insurance or the discount in returns necessary to make fair comparisons between crops under conditions where crop insurance is not carried.

Interest on Cash Expense: It is assumed that cash flow crop expenses are borrowed to grow the crop. The average time this money is on loan until harvest is six months. Interest costs are calculated accordingly using a 13.5 percent annual rate.

The column "Cash Costs" estimates the out-of-pocket cash operating expenses incurred on one acre of the indicated crop. The cash costs include estimates for fuel, oil, repairs, fertilizers, seed, chemicals, and crop insurance. These costs, as mentioned earlier, are basic to any analysis of short-term adjustments to increase profitability in the farming operation.

Costs Not Included: The budgets are developed in an industry cost format. The total costs indicated are all costs, cash and otherwise, required to plant, produce, harvest and haul the crop to storage. Storage costs are not included. This allows the producer to separate the marketing cost associated with different marketing strategies from the production costs. No charge is included for general farm overhead.

The returns over total costs shown are the total returns minus the indicated total cost. The total costs include: land, labor, machinery, and other specific costs as listed in the budget. The total cost figure does not include other total farm overhead charges such as automobile expenses, accounting, building and storage costs (except machinery housing, which is included in machine cost) or the labor and fuel used for off-field purposes. The returns over cash costs allow the budget user to estimate returns over cash costs which goes to pay for land, labor, machinery and management.

Fuel and Labor Needed: At the bottom of each budget is an estimate of fuel use per acre in diesel fuel equivalents. Multiply this figure by 1.39 to estimate gasoline equivalents if gasoline-powered tractors are used. Also included are the amount of hours and value of actual field labor, and the portion of annual machinery overhead and operating expenses charged to the budget.

Credit: If credit is limiting, a grower may need to consider crops with lower cash costs requirements and crops that have a high degree of assurance of enough cash return to cover the cash expense incurred. Some crops are more resistant to drought than others; others may be more disease resistant. It is necessary to consider the net cash flow if yields are less than planned. Estimates are given in the line "Returns Over Cash Costs" and include the value if attaining the listed returns, a 20 percent reduction in returns, and a 50 percent reduction in returns. Reductions in returns may occur because of changes in either or both price and yield.

Using the Budget Information for Decision Making

The main purpose of a budget is for planning. At this time of the year, a grower must decide what and how much (acreage) to grow. In the Red River Valley of Minnesota, the most predominant crop is wheat. Another important crop is sugarbeets. Both of these crops can be substituted for potatoes.

Making the decision of what to grow in the upcoming year is a short-run planning situation which looks at maximizing the returns over cash costs for the total farming operation. Of course, this is subject to constraints such as land suitability, input availability, sufficient machinery capacity, adequate operating capital, etc. In the long run, the grower must look at covering all costs, which means adequate payment to the fixed factors of production (land, labor, capital and management). Also, when considering a new crop or a change in production practices, the grower should make an analysis on the expected long-run net returns.

1986 Storage Costs

In order to estimate potato storage costs, we have used a 48,000 cwt., four-bin house with refrigeration and other needed equipment for potato handling. The breakdown of costs is shown in Appendix Table 6. Annual overhead costs on this storage unit are estimated to be \$53,615. The operating costs are calculated separately for seed and processing potatoes. Using processing potatoes as an example, the estimated total cost per cwt. into storage is \$1.84, but the cost per cwt. of potatoes marketed after a 10 percent shrink is \$2.04.

Total Costs with Marketing from Storage

We find it easiest to estimate total costs by converting all costs to a per cwt. marketed basis. This then correctly considers the shrinkage which occurs in storage. The budgets indicate yields available for sale at harvest or yield going into storage. The resulting breakeven price for tablestock potatoes (Table 7) is \$3.19 per cwt. However, if the 155 cwt. of potatoes go into storage and shrink 10 percent, there are only 139.5 cwt. left for sale from that acre. The storage costs of \$1.84 per cwt. now raise the total costs per cwt. produced to be \$5.03. The total costs per cwt. marketed after a 10 percent shrink are \$5.59.

A breakeven analysis has to consider the shrink factors. We have used 10 percent in calculations, but this can vary considerably. In order to adjust for the shrink factor, you must divide the costs before shrink by one minus the shrink factor (1 - .10). Table 7 shows the breakeven price for the various potato production budgets when marketed out of storage and incurring

shrinkage. These are total costs or the prices that would be needed to break even given the stated assumptions on production and storage costs and shrinkage.

In Retrospect

In this analysis, we have estimated the cash operating costs and the overhead costs separately. The cash operating costs for each crop can be expected to be very close to what a grower can expect. These will be very consistent from farm to farm. However, there will be wide variations in overhead costs due to the individual grower's situation and debt load. For example, the young farmer starting out is probably facing cash rent payments and/or principal and interest payments on purchased land and high machinery expenditures. Growers with higher debt loads and high repayment rates may find the returns over listed cash operating costs insufficient to meet scheduled debt repayments.

On the other hand, the established grower with land paid for and most machinery and equipment paid for will find the returns over cash operating costs to be more than adequate to meet cash debt repayments and family living expenses. It is the function of management to constantly be striving to get the farm overhead costs down within reason so that the debt load can be reduced to the point where all the factors of production (land, labor, capital and management) could expect a normal return. Management of the overhead costs is as important as the management devoted to the production and marketing functions.

APPENDIX TABLES

APPENDIX TABLE 1

| POTATOES (1) | POTATOES TABLESTOCK | | 01 09 86 | | |
|---------------------------------|------------------------|---------------------------|----------|-----------------|---------------|
| | UNITS OR APPLIC. | QUANTITY | PRICE | TOTAL AMOUNT | CASH COSTS |
| RETURNS | | | | | |
| ROUND RED POT. | | 155.000 CWT. | 3.000 | 465.00 | |
| TOTAL RETURNS | | | | 465.00 | |
| PLANTING COSTS | | | | | |
| FIELD CULTIVATOR 28 | | .074 HR/A | 45.569 | 3.36 | 1.31 |
| SPRINGTOOTH DRAG 48 | | .033 HR/A | 37.747 | 1.25 | .25 |
| ROUND CERT SEED | | 15.000 CWT. | 5.000 | 75.00 | 75.00 |
| POT SEED TREATMENT | | 15.000 CWT. | .550 | 8.25 | 8.25 |
| POT. SEED CUTTING | | 15.000 CWT | .600 | 9.00 | 9.00 |
| POTATO ROW MARKER 6R | | .134 HR/A | 75.632 | 10.13 | 1.84 |
| POTATO FILLER | | .174 HR/A | 18.685 | 3.25 | .31 |
| POTATO PLANTER 6 ROW | | .174 HR/A | 124.395 | 21.66 | 3.81 |
| HEAVY TRUCK (USED) | 3 | .174 HR/A | 30.209 | 15.77 | 10.96 |
| FERTILIZER | | | | | |
| NITROGEN | | 25.000 LBS. | .220 | 5.50 | 5.50 |
| ANHYDROUS AMMONIA | | 75.000 LBS. | .130 | 9.75 | 9.75 |
| PHOSPHORUS P205 | | 50.000 LBS. | .220 | 11.00 | 11.00 |
| POTASSIUM K20 | | 60.000 LBS. | .100 | 6.00 | 6.00 |
| ANHYDROUS APPLICATOR | | .079 HR/A | 91.269 | 7.17 | 1.97 |
| SPRAYING COSTS | | | | | |
| AERIAL APPLICATION | 5 | 3.500 ACRE | 1.000 | 17.50 | 17.50 |
| INSECTICIDE | 3 | 5.000 | 1.000 | 15.00 | 15.00 |
| FUNGICIDE | 3 | 3.700 | 1.000 | 11.10 | 11.10 |
| VINE KILLER | 2 | 12.000 | 1.000 | 24.00 | 24.00 |
| CULTIVATION | | | | | |
| POTATO CULT. 6 ROW | 3 | .109 HR/A | 26.058 | 8.51 | 2.75 |
| HARVEST COST | | | | | |
| POTATO HRVSTR. 2 ROW | | .502 HR/A | 88.834 | 44.60 | 11.46 |
| HEAVY TRUCK (USED) | 3 | .502 HR/A | 30.209 | 45.50 | 31.62 |
| DISK 21 FT | | .098 HR/A | 43.466 | 4.27 | 1.15 |
| FIELD CULTIVATOR 28 | | .074 HR/A | 45.569 | 3.36 | 1.31 |
| OTHER COSTS | | | | | |
| LAND CHARGE | | 1.000 ACRE | 75.000 | 75.00 | |
| LIGHT TRUCK | | 1.250 HR/A | 16.917 | 21.15 | 9.26 |
| PROMOTION TAXES | | 155.000 | .050 | 7.75 | 7.75 |
| CROP INSURANCE | | 465.000 | .025 | 11.62 | |
| INTEREST ON CASH COSTS | | 277.843 | .065 | 18.06 | |
| TOTAL COSTS | | | | 494.50 | 277.84 |
| RETURNS OVER TOTAL COSTS | | | | | |
| RETURNS OVER TOTAL COSTS | | | | -29.50 | |
| RETURNS OVER CASH COSTS | | | | 187.16 | |
| RETURNS OVER CASH COSTS | 20 PCT | RETURNS REDUCTION | | 94.16 | |
| RETURNS OVER CASH COSTS | 50 PCT | RETURNS REDUCTION | | -45.34 | |
| CASH COSTS/ACRE | 277.84 | MACHINE OPERATING COSTS/A | | 67.45 | |
| MACHINE OWNERSHIP COST/A | 86.77 | FUEL USE/ACRE (GAL) | | 21.55 | |
| TOTAL COST PER CWT. | 3.19 | | | | |
| THRU PLANT | | | | | |
| CASH COST | 212.55 | GROWING | 2.75 | HARVEST | 45.54 |
| LABOR HOURS | .81 | | .34 | | 1.85 |
| LABOR VALUE | 5.49 | | 1.77 | | 11.45 |
| | | | | OTHER | 17.01 |
| | | | | TOTAL | 277.84 |
| | | | | | 4.25 |
| | | | | | 25.20 |

APPENDIX TABLE 2

| POTATOES (2) | RUSSET POTATOES PROCESSING | | 01 09 86 | | |
|---|-------------------------------|----------------------------------|----------|-----------------|---------------|
| | UNITS OR APPLIC. | QUANTITY | PRICE | TOTAL AMOUNT | CASH COSTS |
| RETURNS | | | | | |
| U.S.NO.1 RUSSET | | 145.000 CWT | 3.650 | 529.25 | |
| TOTAL RETURNS | | | | 529.25 | |
| PLANTING COSTS | | | | | |
| FIELD CULTIVATOR 28 | | .074 HR/A | 45.569 | 3.36 | 1.31 |
| SPRINGTOOTH DRAG 48 | | .033 HR/A | 37.747 | 1.25 | .25 |
| RUSSET CERT SEED | | 11.000 CWT. | 6.000 | 66.00 | 66.00 |
| POT SEED TREATMENT | | 11.000 CWT. | .550 | 6.05 | 6.05 |
| POT. SEED CUTTING | | 11.000 CWT | .600 | 6.60 | 6.60 |
| POTATO ROW MARKER 6R | | .134 HR/A | 75.632 | 10.13 | 1.84 |
| POTATO FILLER | | .174 HR/A | 18.685 | 3.25 | .31 |
| POTATO PLANTER 6 ROW | | .174 HR/A | 124.395 | 21.66 | 3.81 |
| HEAVY TRUCK (USED) | 3 | .174 HR/A | 30.209 | 15.77 | 10.96 |
| FERTILIZER | | | | | |
| NITROGEN | | 25.000 LBS. | .220 | 5.50 | 5.50 |
| ANHYDROUS AMMONIA | | 75.000 LBS. | .130 | 9.75 | 9.75 |
| PHOSPHORUS P205 | | 50.000 LBS. | .220 | 11.00 | 11.00 |
| POTASSIUM K2O | | 75.000 LBS. | .100 | 7.50 | 7.50 |
| ANHYDROUS APPLICATOR | | .079 HR/A | 91.269 | 7.17 | 1.97 |
| SPRAYING COSTS | | | | | |
| AERIAL APPLICATION | 5 | 3.500 ACRE | 1.000 | 17.50 | 17.50 |
| INSECTICIDE | 3 | 5.000 | 1.000 | 15.00 | 15.00 |
| FUNGICIDE | 4 | 3.700 | 1.000 | 14.80 | 14.80 |
| CULTIVATION | | | | | |
| POTATO CULT. 6 ROW | 3 | .109 HR/A | 26.058 | 8.51 | 2.75 |
| HARVEST COST | | | | | |
| POTATO HRVSTR. 2 ROW | | .502 HR/A | 88.834 | 44.60 | 11.46 |
| HEAVY TRUCK (USED) | 3 | .502 HR/A | 30.209 | 45.50 | 31.62 |
| DISK 21 FT | | .098 HR/A | 43.466 | 4.27 | 1.15 |
| FIELD CULTIVATOR 28 | | .074 HR/A | 45.569 | 3.36 | 1.31 |
| OTHER COSTS | | | | | |
| LAND CHARGE | | 1.000 ACRE | 75.000 | 75.00 | |
| LIGHT TRUCK | | 1.250 HR/A | 16.917 | 21.15 | 9.26 |
| PROMOTION TAXES | | 145.000 | .050 | 7.25 | 7.25 |
| CROP INSURANCE | | 529.250 | .025 | 13.23 | |
| INTEREST ON CASH COSTS | | 244.943 | .065 | 15.92 | |
| TOTAL COSTS | | | | 461.07 | 244.94 |
| RETURNS OVER TOTAL COSTS | | | | 68.18 | |
| RETURNS OVER CASH COSTS | | | | 284.31 | |
| RETURNS OVER CASH COSTS 20 PCT RETURNS REDUCTION | | | | 178.46 | |
| RETURNS OVER CASH COSTS 50 PCT RETURNS REDUCTION | | | | 19.68 | |
| CASH COSTS/ACRE | 244.94 | MACHINE OPERATING COSTS/A | | 67.45 | |
| MACHINE OWNERSHIP COST/A | 86.77 | FUEL USE/ACRE (GAL) | | 21.55 | |
| TOTAL COST PER CWT | 3.18 | | | | |
| THRU PLANT GROWING HARVEST OTHER TOTAL | | | | | |
| CASH COST | 180.15 | 2.75 | 45.54 | 16.51 | 244.94 |
| LABOR HOURS | .81 | .34 | 1.85 | 1.25 | 4.25 |
| LABOR VALUE | 5.49 | 1.77 | 11.45 | 6.50 | 25.20 |

APPENDIX TABLE 3

| POTATOES (3) | ROUND WHITE POTATOES PROCESSING | | 01 09 86 | | |
|---|------------------------------------|---------------------------|----------|-----------------|---------------|
| | UNITS OR APPLIC. | QUANTITY | PRICE | TOTAL AMOUNT | CASH COSTS |
| RETURNS | | | | | |
| ROUND WHITE POT. | | 165.000 CWT. | 3.000 | 495.00 | |
| TOTAL RETURNS | | | | 495.00 | |
| PLANTING COSTS | | | | | |
| FIELD CULTIVATOR 28 | | .074 HR/A | 45.569 | 3.36 | 1.31 |
| SPRINGTOOTH DRAG 48 | | .033 HR/A | 37.747 | 1.25 | .25 |
| ROUND CERT SEED | | 15.000 CWT. | 5.000 | 75.00 | 75.00 |
| POT SEED TREATMENT | | 15.000 CWT. | .550 | 8.25 | 8.25 |
| POT. SEED CUTTING | | 15.000 CWT | .600 | 9.00 | 9.00 |
| POTATO ROW MARKER 6R | | .134 HR/A | 75.632 | 10.13 | 1.84 |
| POTATO FILLER | | .174 HR/A | 18.685 | 3.25 | .31 |
| POTATO PLANTER 6 ROW | | .174 HR/A | 124.395 | 21.66 | 3.81 |
| HEAVY TRUCK (USED) | 3 | .174 HR/A | 30.209 | 15.77 | 10.96 |
| FERTILIZER | | | | | |
| NITROGEN | | 25.000 LBS. | .220 | 5.50 | 5.50 |
| ANHYDROUS AMMONIA | | 75.000 LBS. | .130 | 9.75 | 9.75 |
| PHOSPHORUS P205 | | 50.000 LBS. | .220 | 11.00 | 11.00 |
| POTASSIUM K2O | | 60.000 LBS. | .100 | 6.00 | 6.00 |
| ANHYDROUS APPLICATOR | | .079 HR/A | 91.269 | 7.17 | 1.97 |
| SPRAYING COSTS | | | | | |
| AERIAL APPLICATION | 4 | 3.500 ACRE | 1.000 | 14.00 | 14.00 |
| INSECTICIDE | 3 | 5.000 | 1.000 | 15.00 | 15.00 |
| FUNGICIDE | 4 | 3.700 | 1.000 | 14.80 | 14.80 |
| SPROUT INHIB & APP | | 12.000 | 1.000 | 12.00 | 12.00 |
| CULTIVATION | | | | | |
| POTATO CULT. 6 ROW | 4 | .109 HR/A | 26.058 | 11.34 | 3.67 |
| HARVEST COST | | | | | |
| POTATO HRVSTR. 2 ROW | | .502 HR/A | 88.834 | 44.60 | 11.46 |
| HEAVY TRUCK (USED) | 3 | .502 HR/A | 30.209 | 45.50 | 31.62 |
| DISK 21 FT | | .098 HR/A | 43.466 | 4.27 | 1.15 |
| FIELD CULTIVATOR 28 | | .074 HR/A | 45.569 | 3.36 | 1.31 |
| OTHER COSTS | | | | | |
| LAND CHARGE | | 1.000 ACRE | 75.000 | 75.00 | |
| LIGHT TRUCK | | 1.250 HR/A | 16.917 | 21.15 | 9.26 |
| PROMOTION TAXES | | 165.000 | .050 | 8.25 | 8.25 |
| CROP INSURANCE | | 495.000 | .025 | 12.37 | |
| INTEREST ON CASH COSTS | | 267.460 | .065 | 17.38 | |
| TOTAL COSTS | | | | 486.11 | 267.46 |
| RETURNS OVER TOTAL COSTS | | | | 8.89 | |
| RETURNS OVER CASH COSTS | | | | 227.54 | |
| RETURNS OVER CASH COSTS 20 PCT RETURNS REDUCTION | | | | 128.54 | |
| RETURNS OVER CASH COSTS 50 PCT RETURNS REDUCTION | | | | -19.96 | |
| CASH COSTS/ACRE | 267.46 | MACHINE OPERATING COSTS/A | | 68.36 | |
| MACHINE OWNERSHIP COST/A | 88.10 | FUEL USE/ACRE (GAL) | | 22.04 | |
| TOTAL COST PER CWT. | 2.95 | | | | |
| THRU PLANT GROWING HARVEST OTHER TOTAL | | | | | |
| CASH COST | 200.75 | 3.67 | 45.54 | 17.51 | 267.46 |
| LABOR HOURS | .81 | .45 | 1.85 | 1.25 | 4.36 |
| LABOR VALUE | 5.49 | 2.35 | 11.45 | 6.50 | 25.79 |

APPENDIX TABLE 4

| POTATOES (4) | RUSSET POTATOES SEED | | 01 09 86 | | |
|--------------------------|-------------------------|---------------------------|----------|-----------------|---------------|
| RETURNS | UNITS OR APPLIC. | QUANTITY | PRICE | TOTAL AMOUNT | CASH COSTS |
| RUSSET CERT. SEED | | 140.000 CWT | 4.500 | 630.00 | |
| JUMBOS POT. | | 15.000 CWT. | 2.000 | 30.00 | |
| TOTAL RETURNS | | | | 660.00 | |
| PLANTING COSTS | | | | | |
| FIELD CULTIVATOR 28 | | .074 HR/A | 45.569 | 3.36 | 1.31 |
| SPRINGTOOTH DRAG 48 | | .033 HR/A | 37.747 | 1.25 | .25 |
| RUSSET FOUND SEED | | 18.000 CWT. | 7.000 | 126.00 | 126.00 |
| POT SEED TREATMENT | | 18.000 CWT. | .350 | 9.90 | 9.90 |
| POT. SEED CUTTING | | 18.000 CWT | .600 | 10.80 | 10.80 |
| POTATO ROW MARKER 6R | | .134 HR/A | 75.632 | 10.13 | 1.84 |
| POTATO FILLER | | .174 HR/A | 18.685 | 3.25 | .31 |
| POTATO PLANTER 6 ROW | | .174 HR/A | 124.395 | 21.66 | 3.81 |
| HEAVY TRUCK (USED) | 3 | .174 HR/A | 30.209 | 15.77 | 10.96 |
| FERTILIZER | | | | | |
| ANHYDROUS AMMONIA | | 75.000 LBS. | .130 | 9.75 | 9.75 |
| NITROGEN | | 25.000 LBS. | .220 | 5.50 | 5.50 |
| PHOSPHORUS P2O5 | | 50.000 LBS. | .220 | 11.00 | 11.00 |
| POTASSIUM K2O | | 75.000 LBS. | .100 | 7.50 | 7.50 |
| ANHYDROUS APPLICATOR | | .079 HR/A | 91.269 | 7.17 | 1.97 |
| SPRAYING COSTS | | | | | |
| AERIAL APPLICATION | 5 | 3.500 ACRE | 1.000 | 17.50 | 17.50 |
| INSECTICIDE | | 12.000 | 1.000 | 12.00 | 12.00 |
| INSECTICIDE | 2 | 6.250 | 1.000 | 12.50 | 12.50 |
| FUNGICIDE | 4 | 3.700 | 1.000 | 14.80 | 14.80 |
| VINE KILLER | 2 | 8.750 | 1.000 | 17.50 | 17.50 |
| CULTIVATION | | | | | |
| POTATO CULT. 6 ROW | 3 | .109 HR/A | 26.058 | 8.51 | 2.75 |
| ROUGEING | | 5.000 | 1.000 | 5.00 | 5.00 |
| HARVEST COST | | | | | |
| POTATO HVSTR SEED 2R | | .669 HR/A | 81.634 | 54.65 | 16.25 |
| HEAVY TRUCK (USED) | 3 | .669 HR/A | 30.209 | 60.63 | 42.14 |
| DISK 21 FT | | .098 HR/A | 43.466 | 4.27 | 1.15 |
| FIELD CULTIVATOR 28 | | .074 HR/A | 45.569 | 3.36 | 1.31 |
| OTHER COSTS | | | | | |
| LAND CHARGE | | 1.000 ACRE | 75.000 | 75.00 | |
| LIGHT TRUCK | | 1.250 HR/A | 16.917 | 21.15 | 9.26 |
| FIELD + DISEASE TEST | | 1.000 ACRE | 11.000 | 11.00 | 11.00 |
| INSPECTION | | 140.000 CWT. | .055 | 7.70 | 7.70 |
| PROMOTION TAXES | | 160.000 | .050 | 8.00 | 8.00 |
| CROP INSURANCE | | 660.000 | .025 | 16.50 | |
| INTEREST ON CASH COSTS | | 379.755 | .065 | 24.68 | |
| TOTAL COSTS | | | | 617.78 | 379.75 |
| RETURNS OVER TOTAL COSTS | | | | 42.22 | |
| RETURNS OVER CASH COSTS | | | | 280.25 | |
| RETURNS OVER CASH COSTS | 20 PCT | RETURNS REDUCTION | | 148.25 | |
| RETURNS OVER CASH COSTS | 50 PCT | RETURNS REDUCTION | | -49.75 | |
| CASH COSTS/ACRE | 379.75 | MACHINE OPERATING COSTS/A | | 80.15 | |
| MACHINE OWNERSHIP COST/A | 93.13 | FUEL USE/ACRE (GAL) | | 24.84 | |
| THRU PLANT | | | | | |
| CASH COST | 275.20 | GROWING | 7.75 | HARVEST | 60.85 |
| LABOR HOURS | .81 | | .34 | | 2.40 |
| LABOR VALUE | 5.49 | | 1.77 | | 14.96 |
| | | OTHER | | | 35.96 |
| | | TOTAL | | | 379.75 |
| | | | | | 4.81 |
| | | | | | 28.71 |

APPENDIX TABLE 5

| POTATOES (5) | ROUND POTATO SEED | | 01 09 86 | | |
|---|----------------------|---------------|----------------------------------|-----------------|---------------|
| | UNITS OR APPLIC. | QUANTITY | PRICE | TOTAL AMOUNT | CASH COSTS |
| RETURNS | | | | | |
| ROUND CERT. SEED | | 150.000 CWT. | 4.000 | 600.00 | |
| JUMBOS POT. | | 15.000 CWT. | 2.000 | 30.00 | |
| TOTAL RETURNS | | | | 630.00 | |
| PLANTING COSTS | | | | | |
| FIELD CULTIVATOR 28 | | .074 HR/A | 45.569 | 3.36 | 1.31 |
| SPRINGTOOTH DRAG 48 | | .033 HR/A | 37.747 | 1.25 | .25 |
| ROUND FOUND SEED | | 18.000 CWT. | 6.000 | 108.00 | 108.00 |
| POT SEED TREATMENT | | 18.000 CWT. | .550 | 9.90 | 9.90 |
| POT. SEED CUTTING | | 18.000 CWT. | .600 | 10.80 | 10.80 |
| POTATO ROW MARKER 6R | | .134 HR/A | 75.632 | 10.13 | 1.84 |
| POTATO FILLER | | .174 HR/A | 18.685 | 3.25 | .31 |
| POTATO PLANTER 6 ROW | | .174 HR/A | 124.395 | 21.66 | 3.81 |
| HEAVY TRUCK (USED) | 3 | .174 HR/A | 30.209 | 15.77 | 10.96 |
| FERTILIZER | | | | | |
| ANHYDROUS AMMONIA | | 50.000 LBS. | .130 | 6.50 | 6.50 |
| NITROGEN | | 25.000 LBS. | .220 | 5.50 | 5.50 |
| PHOSPHORUS P2O5 | | 50.000 LBS. | .220 | 11.00 | 11.00 |
| POTASSIUM K2O | | 60.000 LBS. | .100 | 6.00 | 6.00 |
| ANHYDROUS APPLICATOR | | .079 HR/A | 91.269 | 7.17 | 1.97 |
| SPRAYING COSTS | | | | | |
| AERIAL APPLICATION | 5 | 3.500 ACRE | 1.000 | 17.50 | 17.50 |
| INSECTICIDE | | 12.000 | 1.000 | 12.00 | 12.00 |
| INSECTICIDE | 2 | 6.250 | 1.000 | 12.50 | 12.50 |
| FUNGICIDE | 3 | 3.700 | 1.000 | 11.10 | 11.10 |
| VINE KILLER | 2 | 12.000 | 1.000 | 24.00 | 24.00 |
| CULTIVATION | | | | | |
| POTATO CULT. 6 ROW | 4 | .109 HR/A | 26.058 | 11.34 | 3.67 |
| ROUGEING | | 5.000 | 1.000 | 5.00 | 5.00 |
| HARVEST COST | | | | | |
| POTATO HVSTR SEED 2R | | .669 HR/A | 81.634 | 54.65 | 16.25 |
| HEAVY TRUCK (USED) | 3 | .669 HR/A | 30.209 | 60.63 | 42.14 |
| DISK 21 FT | | .098 HR/A | 43.466 | 4.27 | 1.15 |
| FIELD CULTIVATOR 28 | | .074 HR/A | 45.569 | 3.36 | 1.31 |
| OTHER COSTS | | | | | |
| LAND CHARGE | | 1.000 ACRE | 75.000 | 75.00 | |
| LIGHT TRUCK | | 1.250 HR/A | 16.917 | 21.15 | 9.26 |
| FIELD + DISEASE TEST | | 1.000 ACRE | 11.000 | 11.00 | 11.00 |
| INSPECTION | | 150.000 CWT. | .055 | 8.25 | 8.25 |
| PROMOTION TAXES | | 165.000 | .050 | 8.25 | 8.25 |
| CROP INSURANCE | | 630.000 | .025 | 15.75 | |
| INTEREST ON CASH COSTS | | 361.522 | .065 | 23.50 | |
| TOTAL COSTS | | | | 599.53 | 361.52 |
| RETURNS OVER TOTAL COSTS | | | | 30.47 | |
| RETURNS OVER CASH COSTS | | | | 268.48 | |
| RETURNS OVER CASH COSTS 20 PCT RETURNS REDUCTION | | | | 142.48 | |
| RETURNS OVER CASH COSTS 50 PCT RETURNS REDUCTION | | | | -46.52 | |
| CASH COSTS/ACRE | | 361.52 | MACHINE OPERATING COSTS/A | | 81.07 |
| MACHINE OWNERSHIP COST/A | | 94.46 | FUEL USE/ACRE (GAL) | | 25.33 |
| THRU PLANT GROWING HARVEST OTHER TOTAL | | | | | |
| CASH COST | 255.25 | 8.67 | 60.85 | 36.76 | 361.52 |
| LABOR HOURS | .81 | .45 | 2.40 | 1.25 | 4.92 |
| LABOR VALUE | 5.49 | 2.35 | 14.96 | 6.50 | 29.30 |

APPENDIX TABLE 6

1986 ESTIMATED POTATO STORAGE COSTS

12,000 Cwt. Bin
 (48,000 Cwt. House)
 Stored 6 Months
 New Cost/Cwt. \$5.00

| <u>Item</u> | <u>Total Cost</u> | <u>Annual Percent</u> | <u>Annual Cost</u> |
|--|-------------------|-----------------------|--------------------|
| Building (4-bin) - 20 years | \$240,000 | 15.5 | \$37,200 |
| Refrigeration - 20 years | 10,000 | 15.5 | 1,500 |
| Equipment (Bobcat Pilers, etc.) - 10 years | 59,000 | 23.5 | 13,865 |
| Railroad Siding Lease | | | <u>1,000</u> |
| Total Annual Overhead Costs | | | \$53,615 |

Annual Operating Costs

| <u>Seed</u> | | <u>Processing</u> | |
|--|-----------------|--|----------------|
| Electricity 46,286 KWH @ .065 | \$ 3,009 | Electricity 85,714 KWH @ .065 | \$ 5,571 |
| Telephone | 1,200 | Telephone | 2,400 |
| Insurance 48,000 x \$6.00 x .015 | 4,320 | Insurance 48,000 x \$4.00 x .015 | 2,880 |
| Labor 5 people, 500 hrs. @ \$5.90/hr. 2 hrs./day @ \$5.90 (150 days) | 14,750 1,770 | Labor 4 people, 300 hrs. @ \$5.90/hr. 2 hrs./day @ \$5.90 (150 days) | 7,080 1,770 |
| Office Supplies | 1,000 | Office Supplies | 1,000 |
| Interest on Inventory 43,200 x \$6.00 x .060 | 15,552 | Interest on Inventory 43,200 x \$4.00 x .060 | 10,368 |
| Disinfectant | <u>1,000</u> | Disinfectant | 750 |
| | | Sprout Inhibitor 6¢/Cwt. | <u>2,880</u> |
| Total Operating Cost | \$42,601 | Total Operating Cost | \$34,699 |
| Total Annual Cost | \$96,216 | Total Annual Cost | \$88,314 |
| Total Cost/Cwt. Stored | \$ 2.00 | Total Cost/Cwt. Stored | \$ 1.84 |
| Total Cost/Cwt. Marketed 10% Shrink | \$ 2.23 | Total Cost/Cwt. Marketed 10% Shrink | \$ 2.04 |

APPENDIX TABLE 7

1986 Breakeven Prices for the Various Potato
Production Budgets when Marketed Out of Storage ^{1/}

| | Tablestock Potatoes | Russet Processing | Round White Processing | Russet Seed | Round White Seed |
|-----------------------------|------------------------|----------------------|---------------------------|---------------------|---------------------|
| Cwt./Acre | 155 | 145 | 165 | 140 | 150 |
| Total Cost | \$495 | \$461 | \$486 | \$588 ^{2/} | \$589 ^{2/} |
| Cost/Cwt. | 3.19 | 3.18 | 2.95 | 4.20 | 3.93 |
| Storage Cost/Cwt. | 1.84 | 1.84 | 1.84 | 2.00 | 2.00 |
| Total Cost/Cwt. Produced | 5.03 | 5.02 | 4.79 | 6.20 | 5.93 |
| Shrinkage Percent | 10 | 10 | 10 | 10 | 10 |
| Total Cost/Cwt. Marketed | \$5.59 | \$5.58 | \$5.32 | \$6.89 | \$6.59 |

^{1/}After shrinkage in storage

^{2/}Total cost credited with sale of jumbos.