**UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION**
**AGRICULTURE AND NATURAL RESOURCES**
**UC DAVIS DEPARTMENT OF AGRICULTURAL AND RESOURCE ECONOMICS**

# 2023
# SAMPLE COSTS TO PRODUCE
# POTATOES

## CHIPPERS for PROCESSING
## KLAMATH BASIN OF THE INTERMOUNTAIN REGION


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**Sample Costs to Produce Potatoes Chippers for Processing**
In the Tulelake-Klamath Basin of the Intermountain Region-2023

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**STUDY CONTENTS**



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## INTRODUCTION

The sample costs to grow potatoes in the Klamath Basin of the Intermountain Region bound for processing (chippers) are presented in this study. The study is intended as a guide only, and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans. The practices described are based on production procedures considered typical for this crop and area but will not apply to every situation. Sample costs for labor, materials, equipment, and custom services are based on current figures. A "*Your Cost*" column in Tables 1 and 2 is provided for you to enter your costs.

For an explanation of calculations used in the study refer to the section titled Assumptions. For more information contact Paul Long, Department of Agricultural and Resource Economics, University of California, Davis at 530-752-4651 or pmlong@ucdavis.edu You may also contact Rob Wilson at 530-667-5117 or rgwilson@ucanr.edu , http://ucanr.edu/sites/Intermountain_REC/.

Sample Cost of Production studies for many commodities are available and can be downloaded from the website, http://coststudies.ucdavis.edu. Archived studies are also available on the website.


**Costs and Returns Study Program/Acknowledgements**. A cost and return study is a compilation of specific agricultural crop data collected from the region where the study is based. The authors thank the farmer cooperators and the industry representatives who provided information, assistance, and expert advice. The University of California, Division of Agriculture and Natural Resources (UCANR) is an equal opportunity provider.

## ASSUMPTIONS

The following assumptions pertain to sample costs to produce potatoes for fresh market in the Klamath Basin of the Intermountain Region. Practices described should not be considered recommendations by the University of California, but represent production procedures considered typical for this crop and area. Some of the costs and practices may not be applicable to your situation or used during every production year. Other practices not indicated may be needed. Cultural practices and costs to produce potatoes will vary by grower and region, and differences can be significant. The practices and inputs used in this cost study serve as a sample or guide, only. The costs are presented on an annual, per acre basis. **The use of trade names in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products.**

**Farm**. This report is based on a hypothetical 1,500-acre farm. Potatoes are grown on 200 acres of which the grower rents. The 1,500-acre farm has 50 acres consisting of roads, irrigation systems, farmstead, and unused or unusable land. Typically, a grower with this amount of potato acreage will have several non-adjacent fields and the cultural practices usually vary among fields. Extra costs may be involved for moving equipment between fields, but are not included in this study. Other crops that might be grown in rotation with the potatoes include onions, small grains, alfalfa, peppermint, and horseradish. In this report, practices completed on less than 100% of the potato acreage are denoted as a percentage of the total potato crop acreage. This report for chipper potatoes for processing and the fresh market potatoes report are based on the same hypothetical farm. Table 5 lists some of the business overhead costs at 500 acres due to this assumption.

## CULTURAL PRACTICES AND MATERIAL INPUTS

**Land Preparation**. It is assumed that the ground planted to the potato crop is coming out of rotation of another crop. It is also assumed that 80% of the acreage will need the preceding crop residue chopped to start ground preparations in the fall before planting the next spring. A heavy stubble disc and ring roller are used to incorporate the residue into the soil. Half of the acreage is deep ripped.

**Fumigation**. This study assumes 25% of the acreage will be fumigated in the fall and 25% of the acreage is fumigated in the spring. Fall-fumigated fields are irrigated with 2 acre-inches of water using wheel line sprinklers after fall tillage to bring soil moisture to the optimal level for fumigation. Fields are then rotospiked and soil fumigates (Vapam HL) are incorporated into the soil. Beginning in April the potato ground is opened with a chisel and ring roller. Fields are then rotospiked and soil fumigants are incorporated into the soil with rotospiking or shank-injection 5 weeks before planting. Rows are pulled shortly before planting and one cultivation/hilling operation is included to control small weeds and reduce tuber exposure to sunlight, which lessons tuber greening. Herbicides are incorporated on 25% of the acreage during this operation.

**Fertilization**. A mixed preplant fertilizer of nitrogen, phosphorus and potassium are custom applied prior to planting in May at a cost of 13.75 an acre. During the growing season UAN 32 is applied through the sprinklers in June, July and August. Total nitrogen and potassium for the season is at 150 pounds each per acre.

**Planting**. Potato seeds are cut, treated with a fungicide, and hauled to the grower by custom service. An additional fungicide, such as Quadris is often applied in the furrow at planting. Vydate or another nemacide is applied in the furrow at planting to suppress nematodes. Potatoes are planted in 36-inch beds at a rate of 22 cwt per acre by the grower.

**Irrigation**. Potatoes are irrigated a total of 20 acre-inches which is applied with the sprinklers from June through August, during the growing season. Water costs are $75 per acre-foot which equals $6.25 per acre inch. A cost of $12 per acre-inch is used for this study which includes booster pumping costs and Oregon Energy Management. (OEM) fees. Growers often apply either fertilizers or pesticides with water through the irrigation system, a process known as chemigation. Prior to harvest, all of the pipes are removed from the fields. Irrigation labor for the entire growing season is included with installation/removal costs for the irrigation pipe.

**Pest Management.** The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines*. For information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. For information and pesticide use permits, contact the local county agricultural commissioner's office. **Pesticides mentioned in this study are used to calculate rates and costs. Although the pesticides mentioned are commonly used by growers, many other pesticides are available. Check with your PCA, field crops farm advisor, and/or the UC IPM website for current recommendations.** Pesticide costs may vary by location, brand, and grower volume.

Pesticide and fertilizer applications are made by either chemigation (pesticides and/or fertilizers applied through the irrigation water), by tractor-mounted ground sprayer, or foliar-broadcasting by airplane. Insecticides and fungicides can be tank-mixed and applied to the crop in the same operation. Check individual pesticide labels for compatibility, mixing and usage. Some pesticides are applied to a portion of the acreage. Pesticides with different modes of action and different active ingredients should be rotated to avoid resistance development by the targeted pests. Adjuvants are recommended for many pesticides for effective control and are an added cost. Adjuvants are not included as a cost in this study.

*Pest Control Adviser/Certified Crop Advisor (PCA/CCA*). Written recommendations are required for many pesticides and are available from licensed pest control or certified crop advisers. In addition, the PCA/CCA or an independent consultant will monitor the field for agronomic problems including irrigation and nutrition. They can also take weekly petiole samples during the growing season for fertilizer recommendations. Growers may hire a private PCA/CCA or receive the service as part of a service agreement with an agricultural chemical and fertilizer company.

*Weeds*. Pre-emergence herbicides (Prowl, Sencor, Matrix.) are applied prior to planting with a tractor and incorporated into the soil with a bed shaper on 25% of the acreage. Pre-emergence herbicides are broadcast applied and incorporated with irrigation after planting but before potato emergence on the remaining 75% of acres. Post-emergence herbicides such as desiccant application are applied to 100% of the acreage when potatoes are 3 to 5 inches tall.

*Insects and Nematodes*. Treatment for insects and nematodes begins with soil fumigation. An insecticide/nemacide (Vydate, Movento.) is applied to the soil to suppress nematodes at planting. Insecticide treatment for worm and aphid control is applied broadcast-foliar applied with an airplane. Monitoring of pest populations during the growing season will determine how often control is needed.

*Diseases.* The most problematic pests of potatoes are diseases. Control begins with soil fumigation in the fall or spring. A fungicide (Quadris, Ridomil, Luna, Tanos) is applied to the potato seeds and soil at planting. In June and July, a fungicide is often applied through the irrigation system to control foliar diseases. In August another disease application is made by aircraft for control of foliar diseases.

**Endangered Species**. It is important to know if your farm is located in an area where endangered or threatened species reside. PRESCRIBE is an online database application to allow pesticide applicators to learn if endangered species are in the vicinity of an application site, and the use limitations applicable to the

pesticide product(s) they intend to use. The database is implemented by the California Department of Pesticide Regulation. https://www.cdpr.ca.gov/docs/endspec/prescint.htm

**Growth Regulator and Desiccant**. A growth regulator, Royal MH-30, is used to prevent sprouting in storage and is applied in August by aircraft over 50% of the acreage. Later in September a desiccant is used to dry out the remaining plant tops. Much of the above-ground vegetative matter dries out with crop maturity or killing fall frosts, but Reglone is applied by aircraft on 100% of the acreage to aid in harvesting by drying out remaining growth.

**Harvest.** After sprinkler pipe removal the beds and vines are flattened by a roller and vines are cut. The potatoes are dug, harvested, and field-cleaned in one pass with a tractor pulling a PTO driven four-row digger, and deposited directly into a 15–22-ton bottom-conveyor belt truck for transport to storage. The truck follows alongside the harvester in the field.

Growers may choose to own harvesting equipment, purchased either new or used, or hire a custom harvester. Many factors are important in deciding which harvesting option a grower uses.

**Transportation and Storage.** Once the trucks are loaded in the field, they are driven to the storage shed. Hauling potatoes from the field to the storage sheds is assumed to be a 30-mile roundtrip.

Once at the sheds, trucks are unloaded by the conveyer belt, which runs the length of the truck bed and discharges potatoes into a large holding tub. These special tubs allow for faster unloading of the trucks and movement into the storage shed. In this study, it is assumed that the grower hauls his potatoes to a custom storage facility. Most potatoes are stored in the sheds for six months. During storage, 50% of the potatoes are treated to prevent sprouting.

**Yields**. This study assumes a yield of 535 cwt per acre for processing-chippers, which is the 2023 average yield for Modoc and Siskiyou counties. The yields have varied over the years in the Tulelake Basin of the Intermountain Region.

**Returns**. 2023 potatoes grown in this region are valued at $11.25 per cwt for processing-chippers. The price information is taken from Modoc and Siskiyou counties. This price reflects actual grower returns with actual packing/shed storage included.

**Assessments**. Under a state marketing order a mandatory assessment fee is collected and administered by the California Potato Research Advisory Board (CPRAB). This assessment of $0.02 per cwt pays for potato research in California.

## LABOR, EQUIPMENT AND INTEREST

**Labor**. Labor rates of $28.66 per hour for machine operators and $25.72 for general labor includes payroll overhead of 47%. The basic hourly wages are $19.50 for machine operators and $17.50 for general labor. The overhead includes the employer's share of federal and California state payroll taxes, workers' compensation insurance for field crops and a percentage for other possible benefits. Workers' compensation insurance costs will vary among growers. The cost is based on the average industry rate as of May 2023. Labor for operations involving machinery are 20% higher than the operation time given in Table 2 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

**Equipment Operating Costs**. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (ASABE). Fuel

and lubrication costs are also determined by ASABE equations based on maximum power takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are $4.10 and $3.70 per gallon, respectively. The costs are based on May 2023 prices from the Energy Information Administration, Department of Energy (DOE) weekly data.

*Fuel Lube & Repair*. The fuel, lube, and repair costs per acre for each operation in Table 1 are determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

**Interest on Operating Capital**. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 8.50% per year. It is assumed that all cash operations are financed. A nominal interest rate is the typical market cost of borrowed funds. Any postharvest costs of operations are discounted back to the harvest month using a negative interest charge. The rate will vary depending upon various factors, but the rate in this study is considered a typical lending rate by a farm lending agency as of May 2023.

**Risk.** Risks associated with potato production are not assigned a production cost. While this study makes every effort to model a production system based on typical, real-world practices, it cannot fully represent financial, agronomic and market risks, which affect profitability and economic viability of fresh market potato production. Because of so many potential risk factors, effective risk management must combine specific tactics in a detailed manner and in various combinations for a sustainable operation. Any returns above total costs are considered returns on risk and investment to management.

## CASH OVERHEAD

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, rents, and investment repairs. Cash overhead costs are included in Tables 1, 2, 3 and 4.

**Property Taxes**. Counties charge a base property tax at the rate of 1% on the assessed value of the property including land, equipment, buildings, and improvements. In some counties, special assessment districts exist and charge additional taxes on property. For this study, county taxes are calculated as 1% of the average value of the property.

**Insurance**. Insurance for farm investments varies depending on the assets included and the amount of coverage.

*Property Insurance*. Property insurance provides coverage for property loss and is charged at 0.843% of the average value of the assets over their useful life.

*Liability Insurance*. A standard farm liability insurance policy will help cover the expenses for which you become legally obligated to pay for bodily injury claims on your property and damages to another person's property as a result of a covered accident. Common liability expenses covered under your policy include attorney fees and court costs, medical expenses for people injured on your property, injury or damage to another's property. In this study, liability insurance costs $1,545 for the entire farm.

*Crop Insurance*. This is available to growers for any unavoidable loss of production, damage or poor quality resulting from adverse weather conditions such as cool wet weather, freeze, frost, hail, heat, rain, wind and

damage from birds, drought, earthquakes and fire. Coverage levels are from 50%-85% of the approved average yield as established by verifiable production records. Actual insurance coverage is by unit, not by acre. Due to variability in coverages no level is specified in this study.

**Field Sanitation**. Sanitation services includes double portable bathrooms and hand wash area. A shaded lunching table is also provided. This service is contracted annually.

**Irrigation System.** The irrigation delivery system from the district to the field is already in place. The solid set pipe and two booster pumps are owned by the grower. This includes lay flat main lines, valves and connectors.

**Supervisor Salary**. One supervisor salary is charged at 50% time, or $55 per acre for this study.

**Office Expense**. Office and business expenses are estimated at $75.00 per acre. These expenses include office supplies, telephones, bookkeeping, accounting and legal fees, road maintenance, and miscellaneous business expenses.

**Regulatory Compliance.** A set rate of 55.00 per acre is set for all regulatory costs, and fees assessed to the grower by compliance agencies.

**Land Rent**. In this region land rent ranges from $450 to $700 per acre are with surface water attached to the land, but the water is not paid for by the landowner. The cost of the water is paid by the grower renting the land. Cash rent of $550 per acre is used for this study. The grower in this study rents 205 acres of which 200 are producing or planted acres and the grower pays $550 per rented producing acre to the landlord. The non-producing acres consist of roads, irrigation system, and equipment yard.

**GPS Auto-Trac**. An annual activation fee is charged for Auto-trac service that controls the GPS systems mounted in tractors.

**Investment Repairs**. Annual cash maintenance or repair costs are associated with investments under non-cash overhead. Repairs to the fuel tanks and pumps, shop building, shop tools, irrigations system and tool carrier are calculated at 2% of the new purchase price distributed over the life of the investment.

## NON-CASH OVERHEAD

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Annual ownership costs for equipment and investments are shown in Tables 1, 2, 5, and 6 as the capital recovery cost on an annual per acre basis.

*Capital Recovery Costs*. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). Put another way, it is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The calculation for the annual capital recovery costs is as follows:
((Purchase Price – Salvage Value) x Capital Recovery Factor) + (Salvage Value x Interest Rate).

*Salvage Value*. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements), the remaining value is a percentage of the new

cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASAE, by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is equal to the purchase price because land does not depreciate. The purchase price and salvage value for certain equipment and investments are shown in Table 5.

*Interest Rate.* The interest rate of 7.00% used to calculate capital recovery cost is the effective long term interest rate as of May 2023. The interest rate is provided by a local farm lending agency and will vary according to risk and amount of loan.

**Equipment.** Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in Tables 6 and 7. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of repairs, fuel, and lubrication and are discussed under operating costs.

**Table Values.** Due to rounding, the totals may be slightly different from the sum of the components.

**Acknowledgments.** Thank you to all industry professionals, growers, and cooperators for gathering and providing information for the cost studies.

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**TABLE 1. COSTS PER ACRE TO PRODUCE POTATOES-CHIPPERS**

**KLAMATH BASIN- TULELAKE 2023**

| | | Cash and Labor Costs per Acre | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operation | Equipment Time (Hrs/Ac) | Labor Cost | Fuel | Lube & Repairs | Material Cost | Custom/ Rent | Total Cost | Your Cost |
| Pre-plant: | | | | | | | | |
| Chop Residue 80% Ac | 0.17 | 5.25 | 5.00 | 2.04 | 0.00 | 0.00 | 12.29 | |
| Stubble Disc & Roll | 0.30 | 4.64 | 7.94 | 3.36 | 0.00 | 0.00 | 15.93 | |
| Sub-Soil 50% Ac | 0.67 | 10.43 | 17.86 | 8.23 | 0.00 | 0.00 | 36.53 | |
| Pre-Irrigation/Sprinklers | 0.00 | 0.00 | 0.00 | 0.00 | 6.00 | 0.00 | 6.00 | |
| Roto-Spike/Fall-Fumigate | 0.11 | 3.44 | 4.58 | 1.99 | 53.13 | 0.00 | 63.13 | |
| Gypsum 25% Ac | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 22.50 | 22.50 | |
| Chisel & Roll | 0.11 | 1.72 | 2.94 | 1.08 | 0.00 | 0.00 | 5.74 | |
| Roto-spike/Spring-Fumigate | 0.15 | 4.81 | 6.41 | 2.78 | 138.13 | 0.00 | 152.13 | |
| Ground Rig-Apply Fertilizer | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.75 | 13.75 | |
| Fertilize-Pre-Plant | 0.22 | 6.76 | 9.00 | 2.69 | 269.41 | 0.00 | 287.85 | |
| TOTAL PRE-PLANT COSTS | 1.72 | 37.05 | 53.73 | 22.16 | 466.66 | 36.25 | 615.86 | |
| Cultural: | | | | | | | | |
| Plant Potatoes | 0.27 | 8.31 | 14.24 | 7.09 | 550.00 | 0.00 | 579.65 | |
| At Planting-Fungicide | 0.00 | 0.00 | 0.00 | 0.00 | 45.34 | 0.00 | 45.34 | |
| Irrigation Labor | 0.00 | 257.20 | 0.00 | 0.00 | 0.00 | 0.00 | 257.20 | |
| Irrigate/Sprinklers | 0.00 | 0.00 | 0.00 | 0.00 | 240.00 | 0.00 | 240.00 | |
| Chemigation-Fertilize | 0.00 | 0.00 | 0.00 | 0.00 | 58.00 | 0.00 | 58.00 | |
| Cultivate/Hilling | 0.17 | 5.25 | 7.00 | 2.10 | 41.50 | 0.00 | 55.86 | |
| Chemigation-Disease | 0.00 | 0.00 | 0.00 | 0.00 | 66.38 | 0.00 | 66.38 | |
| Herbicide post emergence | 0.19 | 5.85 | 7.79 | 2.13 | 47.66 | 0.00 | 63.42 | |
| Chemigation-Insects | 0.00 | 0.00 | 0.00 | 0.00 | 13.76 | 0.00 | 13.76 | |
| Insects-Broadcast | 0.00 | 0.00 | 0.00 | 0.00 | 13.76 | 30.00 | 43.76 | |
| Disease-Broadcast | 0.00 | 0.00 | 0.00 | 0.00 | 19.30 | 30.00 | 49.30 | |
| Growth Regulator | 0.00 | 0.00 | 0.00 | 0.00 | 3.75 | 15.00 | 18.75 | |
| Petiole Samples | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 10.00 | |
| 1/2 Ton Pickup Truck | 0.22 | 6.88 | 1.53 | 0.68 | 0.00 | 0.00 | 9.09 | |
| 3/4 Ton Pickup Truck | 0.22 | 6.88 | 1.93 | 0.81 | 0.00 | 0.00 | 9.62 | |
| ATV4WD | 0.22 | 6.88 | 0.81 | 0.15 | 0.00 | 0.00 | 7.84 | |
| Service Truck | 0.19 | 5.85 | 2.88 | 2.56 | 0.00 | 0.00 | 11.28 | |
| Desiccant Application | 0.00 | 0.00 | 0.00 | 0.00 | 17.73 | 15.00 | 32.73 | |
| TOTAL CULTURAL COSTS | 1.47 | 303.10 | 36.17 | 15.53 | 1117.18 | 100.00 | 1571.98 | |
| Harvest: | | | | | | | | |
| Cut Vines/Roll Beds | 0.17 | 5.25 | 5.00 | 1.52 | 0.00 | 0.00 | 11.77 | |
| Dig/Harvest Potatoes | 0.84 | 26.27 | 44.99 | 29.94 | 0.00 | 0.00 | 101.20 | |
| Bulk Potatoes | 0.00 | 51.44 | 0.00 | 0.00 | 0.00 | 0.00 | 51.44 | |
| Haul Potatoes | 2.20 | 68.78 | 33.83 | 9.38 | 0.00 | 0.00 | 111.99 | |
| Assessments/Fees | 0.00 | 0.00 | 0.00 | 0.00 | 10.70 | 0.00 | 10.70 | |
| TOTAL HARVEST COSTS | 3.21 | 151.75 | 83.81 | 40.84 | 10.70 | 0.00 | 287.10 | |
| Post-Harvest: | | | | | | | | |
| Elevate/Holding Tub | 1.10 | 34.39 | 32.72 | 15.63 | 0.00 | 0.00 | 82.74 | |
| Shed-Store Potatoes | 1.10 | 0.00 | 0.00 | 9.76 | 0.00 | 356.85 | 366.61 | |
| Treat For Sprouts | 0.00 | 0.00 | 0.00 | 0.00 | 19.20 | 0.00 | 19.20 | |
| TOTAL POST-HARVEST COSTS | 2.20 | 34.39 | 32.72 | 25.39 | 19.20 | 356.85 | 468.54 | |
| Interest on Operating Capital at 8.5% | | | | | | | 73.35 | |
| TOTAL OPERATING COSTS/ACRE | 8.60 | 526.29 | 206.43 | 103.92 | 1613.74 | 493.10 | 3016.83 | |

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**TABLE 2. COSTS AND RETURNS PER ACRE TO PRODUCE POTATOES-CHIPPERS**

Klamath Basin-Tulelake 2023

| | Quantity/Acre | Unit | Price or Cost/Unit | Value or Cost/Acre | Your Cost |
|---|---|---|---|---|---|
| GROSS RETURNS | | | | | |
| Potatoes- Chippers | 535 | Cwt | 11.25 | 6018.75 | |
| TOTAL GROSS RETURNS | | | | 6018.75 | |
| OPERATING COSTS | | | | | |
| **Herbicide** | | | | **104.37** | |
| Eptam 7E | 1.75 | Pint | 8.69 | 15.21 | |
| Prowl H2O | 2 | Pint | 8.01 | 16.02 | |
| Sencor 4 | 4 | Oz | 6.37 | 25.48 | |
| Matrix SG | 2 | Oz | 23.83 | 47.66 | |
| **Fungicide** | | | | **125.78** | |
| Quadris | 10 | FlOz | 2.09 | 20.90 | |
| Ridomil Gold Bravo | 2 | Lb | 18.39 | 36.78 | |
| Luna Tranquility | 10 | FlOz | 2.96 | 29.60 | |
| Tanos | 10 | Oz | 1.93 | 19.30 | |
| StorOx | 4 | Pint | 4.8 | 19.20 | |
| **Insecticide** | | | | **51.96** | |
| Vydate L | 2 | Pint | 12.22 | 24.44 | |
| Movento | 4 | FlOz | 6.88 | 27.52 | |
| **Fumigant** | | | | **191.25** | |
| Vapam HL | 22.5 | Gal | 8.5 | 191.25 | |
| **Custom** | | | | **493.10** | |
| Gypsum Hauled-Spread | 0.25 | Ton | 90 | 22.50 | |
| Apply Fertilizer Ground Rig | 1 | Acre | 13.75 | 13.75 | |
| Application Air 20G | 3 | Acre | 30 | 90.00 | |
| Petiole Samples | 1 | Acre | 10 | 10.00 | |
| Store Potatoes-Processing | 535 | Cwt | 0.667 | 356.85 | |
| **Fertilizer** | | | | **312.20** | |
| 16-20-0-24% S | 100 | Lb | 1.65 | 165.00 | |
| 10-34-0 | 20 | Gal | 2.23 | 44.60 | |
| Potash | 200 | Lb | 0.223 | 44.60 | |
| UN-32 | 100 | Lb | 0.58 | 58.00 | |
| **Seed** | | | | **550.00** | |
| Seed Potatoes-Treated/Cut/H | 22 | Cwt | 25 | 550.00 | |
| **Assessment** | | | | **10.70** | |
| CPRAB | 535 | Cwt | 0.02 | 10.70 | |
| **Growth Regulator** | | | | **3.75** | |
| Royal MH-30 | 1 | Gal | 3.75 | 3.75 | |
| **Desiccant** | | | | **17.73** | |
| Reglone Desiccant | 1 | Pint | 17.73 | 17.73 | |
| **Irrigation** | | | | **246.00** | |
| Water-Pumped | 20.5 | AcIn | 12 | 246.00 | |
| **Labor** | | | | **526.29** | |
| Equipment Operator | 7.59 | Hr | 28.66 | 217.65 | |
| Irrigation | 10 | Hr | 25.72 | 257.20 | |
| Non-Machine | 2 | Hr | 25.72 | 51.44 | |
| **Machinery** | | | | **310.36** | |
| Fuel-Diesel | 49.78 | Gal | 4.1 | 204.09 | |
| Fuel-Gas | 0.63 | Gal | 3.7 | 2.34 | |
| Lube | | | | 30.96 | |
| Machinery Repair | | | | 72.96 | |
| Interest on Operating Capital 8.50% | | | | 73.35 | |
| TOTAL OPERATING COSTS/ACRE | | | | 3016.83 | |
| TOTAL OPERATING COSTS/CWT | | | | 5.64 | |
| NET RETURNS ABOVE OPERATING COSTS | | | | 3001.92 | |

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

**TABLE 2. CONTINUED COSTS AND RETURNS PER ACRE TO PRODUCE POTATOES-CHIPPERS**

Klamath Basin-Tulelake 2023

| | Quantity/Acre | Unit | Price or Cost/Unit | Value or Cost/Acre | Your Cost |
|---|---|---|---|---|---|
| **Cash Overhead Costs** | | | | | |
| Land Rent-Potatoes | | | | 550.00 | |
| Field Sanitation | | | | 2.00 | |
| Field Supervisor Salary | | | | 55.00 | |
| GPS Auto-TracActivation | | | | 2.33 | |
| Liability Insurance | | | | 1.03 | |
| Office Expense | | | | 75.00 | |
| Regulatory Compliance | | | | 55.00 | |
| Investment Repairs | | | | 4.46 | |
| Property Insurance | | | | 0.76 | |
| TOTAL CASH OVERHEAD COSTS/ACRE | | | | 745.58 | |
| TOTAL CASH OVERHEAD COSTS/CWT | | | | 1.39 | |
| TOTAL CASH COSTS/ACRE | | | | 3762.41 | |
| TOTAL CASH COSTS/CWT | | | | 7.03 | |
| NET RETURNS ABOVE CASH COSTS | | | | 2256.34 | |
| | | | | | |
| **Non-Cash Overhead Costs (Capital Recovery)** | | | | | |
| Building 2400 sq ft | | | | 1.43 | |
| Fuel Tanks 2-500, 1000 gal | | | | 1.35 | |
| Pipe Trailer (10) | | | | 3.15 | |
| 125 Hp Booster Pumps(2) | | | | 3.59 | |
| Semi-Truck & Lowbed | | | | 6.86 | |
| Implement Carrier | | | | 1.18 | |
| GPS Guidence System | | | | 0.77 | |
| Shop Tools | | | | 1.23 | |
| Solid Set | | | | 4.44 | |
| Equipment | | | | 108.12 | |
| | | | | | |
| TOTAL NON-CASH OVERHEAD COSTS/ACRE | | | | 132.11 | |
| TOTAL NON-CASH OVERHEAD COSTS/CWT | | | | 0.247 | |
| TOTAL COSTS/ACRE | | | | 3894.51 | |
| TOTAL NON-CASH COSTS/CWT | | | | 7.279 | |
| NET RETURNS ABOVE TOTAL COSTS | | | | 2124.24 | |

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

**TABLE 3. MONTHLY COSTS PER ACRE TO PRODUCE POTATOES-CHIPPERS**

Klamath Basin-Tulelake 2023

| Operation | Nov | Dec | Jan | Feb | Mar | April | May | June | July | Aug | Sept | Oct | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pre-plant: | | | | | | | | | | | | | |
| Chop Residue 80% Ac | 12 | | | | | | | | | | | | 12.29 |
| Stubble Disc & Roll | 16 | | | | | | | | | | | | 15.93 |
| Sub-Soil 50% Ac | 37 | | | | | | | | | | | | 36.53 |
| Pre-Irrigation/Sprinklers | 6 | | | | | | | | | | | | 6.00 |
| Roto-Spike/Fall-Fumigate | 63 | | | | | | | | | | | | 63.13 |
| Gypsum 25% Ac | 23 | | | | | | | | | | | | 22.50 |
| Chisel & Roll | | | | | | 6 | | | | | | | 5.74 |
| Roto-spike/Spring-Fumigate | | | | | | 152 | | | | | | | 152.13 |
| Ground Rig-Apply Fertilizer | | | | | | | 14 | | | | | | 13.75 |
| Fertilize-Pre-Plant | | | | | | | 288 | | | | | | 287.85 |
| TOTAL PRE-PLANT COSTS | 156 | | | | | 158 | 302 | | | | | | 615.86 |
| Plant Potatoes | | | | | | | 580 | | | | | | 579.65 |
| At Planting-Fungicide | | | | | | | 45 | | | | | | 45.34 |
| Irrigation Labor | | | | | | | 257 | | | | | | 257.20 |
| Irrigate/Sprinklers | | | | | | | 42 | 48 | 72 | 54 | 24 | | 240.00 |
| Chemigation-Fertilize | | | | | | | 58 | | | | | | 58.00 |
| Cultivate/Hilling | | | | | | | 56 | | | | | | 55.86 |
| Chemigation-Disease | | | | | | | | 37 | 30 | | | | 66.38 |
| Herbicide post emergence | | | | | | | | 63 | | | | | 63.42 |
| Chemigation-Insects | | | | | | | | | 14 | | | | 13.76 |
| Insects-Broadcast | | | | | | | | | | 44 | | | 43.76 |
| Disease-Broadcast | | | | | | | | | | 49 | | | 49.30 |
| Growth Regulator | | | | | | | | | | 19 | | | 18.75 |
| Petiole Samples | | | | | | | | | | | 10 | | 10.00 |
| 1/2 Ton Pickup Truck | | | | | | | | | | | 9 | | 9.09 |
| 3/4 Ton Pickup Truck | | | | | | | | | | | 10 | | 9.62 |
| ATV4WD | | | | | | | | | | | 8 | | 7.84 |
| Service Truck | | | | | | | | | | | 11 | | 11.28 |
| Desiccant Application | | | | | | | | | | | 33 | | 32.73 |
| TOTAL CULTURAL COSTS | | | | | | | 1,038 | 148 | 115 | 166 | 105 | | 1,571.98 |
| Cut Vines/Roll Beds | | | | | | | | | | | 12 | | 11.77 |
| Dig/Harvest Potatoes | | | | | | | | | | | | 101 | 101.20 |
| Bulk Potatoes | | | | | | | | | | | | 51 | 51.44 |
| Haul Potatoes | | | | | | | | | | | | 112 | 111.99 |
| Assessments/Fees | | | | | | | | | | | | 11 | 10.70 |
| TOTAL HARVEST COSTS | | | | | | | | | | | 12 | 275 | 287.10 |
| Elevate/Holding Tub | | | | | | | | | | | | 83 | 82.74 |
| Shed-Store Potatoes | | | | | | | | | | | | 367 | 366.61 |
| Treat For Sprouts | | | | | | | | | | | | 19 | 19.20 |
| TOTAL POST-HARVEST COSTS | | | | | | | | | | | | 469 | 468.54 |
| Interest on Operating Capital 8.5% | 1 | 1 | 1 | 1 | 1 | 2 | 11 | 12 | 13 | 14 | 15 | - | 73.35 |
| TOTAL OPERATING COSTS/ACRE | 157 | 1 | 1 | 1 | 1 | 160 | 1,351 | 160 | 128 | 180 | 131 | 744 | 3,016.83 |

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

**TABLE 3. CONTINUED MONTHLY COSTS PER ACRE TO PRODUCE POTATOES-CHIPPERS**

Klamath Basin-Tulelake 2023

| Operation | Nov | Dec | Jan | Feb | Mar | April | May | June | July | Aug | Sept | Oct | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CASH OVERHEAD | | | | | | | | | | | | | |
| Land Rent-Potatoes | | | | | | | | | | | | 550.00 | 550.00 |
| Field Sanitation | | | | 2.00 | | | | | | | | | 2.00 |
| Field Supervisor Salary | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 55.00 |
| GPS Auto-TracActivation | | | | | | | | | | | | 2.33 | 2.33 |
| Liability Insurance | | | | | | | | | | | | 1.03 | 1.03 |
| Office Expense | 6.25 | 6.25 | 6.25 | 6.25 | 6.25 | 6.25 | 6.25 | 6.25 | 6.25 | 6.25 | 6.25 | 6.25 | 75.00 |
| Regulatory Compliance | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 4.58 | 55.00 |
| Investment Repairs | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 4.46 |
| Property Insurance | | | | 0.38 | | | | | | 0.38 | | | 0.76 |
| TOTAL CASH OVERHEAD COSTS/ACRE | 15.79 | 15.79 | 15.79 | 18.17 | 15.79 | 15.79 | 15.79 | 15.79 | 15.79 | 16.17 | 15.79 | 569.15 | 745.58 |
| TOTAL CASH COSTS/ACRE | 173.24 | 16.86 | 16.86 | 19.23 | 16.86 | 175.81 | 1,366.71 | 176.28 | 144.23 | 196.19 | 147.13 | 1,313.02 | 3,762.41 |

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

**TABLE 4. RANGING ANALYSIS - POTATOES-CHIPPERS**

Klamath Basin-Tulelake 2023

**COSTS PER ACRE AT VARYING YIELDS TO PRODUCE POTATOES-CHIPPERS**

| | YIELD (Cwt/Acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **529.00** | **531.00** | **533.00** | **535.00** | **537.00** | **539.00** | **541.00** |
| OPERATING COSTS/ACRE: | | | | | | | |
| Pre-Plant | 616 | 616 | 616 | 616 | 616 | 616 | 616 |
| Cultural | 1,572 | 1,572 | 1,572 | 1,572 | 1,572 | 1,572 | 1,572 |
| Harvest | 284 | 285 | 286 | 287 | 288 | 289 | 290 |
| Post-Harvest | 469 | 469 | 469 | 469 | 469 | 469 | 469 |
| Interest on operating capital@ 8.50% | 73 | 73 | 73 | 73 | 73 | 73 | 73 |
| TOTAL OPERATING COSTS/ACRE | 3,014 | 3,015 | 3,016 | 3,017 | 3,018 | 3,019 | 3,020 |
| TOTAL OPERATING COSTS/CWT | 5.70 | 5.68 | 5.66 | 5.64 | 5.62 | 5.60 | 5.58 |
| CASH OVERHEAD COSTS/ACRE | 746 | 746 | 746 | 746 | 746 | 746 | 746 |
| TOTAL CASH COSTS/ACRE | 3,759 | 3,760 | 3,761 | 3,762 | 3,763 | 3,765 | 3,766 |
| TOTAL CASH COSTS/CWT | 7.11 | 7.08 | 7.06 | 7.03 | 7.01 | 6.98 | 6.96 |
| NON-CASH OVERHEAD COSTS/ACRE | 132 | 132 | 132 | 132 | 132 | 132 | 132 |
| TOTAL COSTS/ACRE | 3,891 | 3,892 | 3,893 | 3,895 | 3,896 | 3,897 | 3,898 |
| TOTAL COSTS/CWT | 7.36 | 7.33 | 7.30 | 7.28 | 7.25 | 7.23 | 7.20 |

**NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR POTATOES-CHIPPERS**

| **PRICE** | **YIELD (Cwt/Acre)** | | | | | | |
|---|---|---|---|---|---|---|---|
| **$/Cwt** | **529.00** | **531.00** | **533.00** | **535.00** | **537.00** | **539.00** | **541.00** |
| **3.75** | -1,030 | -1,023 | -1,017 | -1,011 | -1,004 | -998 | -991 |
| **6.25** | 293 | 304 | 315 | 327 | 338 | 350 | 361 |
| **8.75** | 1,615 | 1,632 | 1,648 | 1,664 | 1,681 | 1,697 | 1,714 |
| **11.25** | 2,938 | 2,959 | 2,980 | 3,002 | 3,023 | 3,045 | 3,066 |
| **13.75** | 4,260 | 4,287 | 4,313 | 4,339 | 4,366 | 4,392 | 4,419 |
| **16.25** | 5,583 | 5,614 | 5,645 | 5,677 | 5,708 | 5,740 | 5,771 |
| **18.75** | 6,905 | 6,942 | 6,978 | 7,014 | 7,051 | 7,087 | 7,124 |

**NET RETURNS PER ACRE ABOVE CASH COSTS FOR POTATOES-CHIPPERS**

| **PRICE** | **YIELD (Cwt/Acre)** | | | | | | |
|---|---|---|---|---|---|---|---|
| **$/Cwt** | **529.00** | **531.00** | **533.00** | **535.00** | **537.00** | **539.00** | **541.00** |
| **3.75** | -1,775 | -1,769 | -1,763 | -1,756 | -1,750 | -1,743 | -1,737 |
| **6.25** | -453 | -442 | -430 | -419 | -407 | -396 | -384 |
| **8.75** | 870 | 886 | 902 | 919 | 935 | 952 | 968 |
| **11.25** | 2,192 | 2,213 | 2,235 | 2,256 | 2,278 | 2,299 | 2,321 |
| **13.75** | 3,515 | 3,541 | 3,567 | 3,594 | 3,620 | 3,647 | 3,673 |
| **16.25** | 4,837 | 4,868 | 4,900 | 4,931 | 4,963 | 4,994 | 5,026 |
| **18.75** | 6,160 | 6,196 | 6,232 | 6,269 | 6,305 | 6,342 | 6,378 |

**NET RETURNS PER ACRE ABOVE TOTAL COST POTATOES-CHIPPERS**

| **PRICE** | **YIELD (Cwt/Acre)** | | | | | | |
|---|---|---|---|---|---|---|---|
| **$/Cwt** | **529.00** | **531.00** | **533.00** | **535.00** | **537.00** | **539.00** | **541.00** |
| **3.75** | -1,908 | -1,901 | -1,895 | -1,888 | -1,882 | -1,875 | -1,869 |
| **6.25** | -585 | -574 | -562 | -551 | -539 | -528 | -516 |
| **8.75** | 737 | 754 | 770 | 787 | 803 | 820 | 836 |
| **11.25** | 2,060 | 2,081 | 2,103 | 2,124 | 2,146 | 2,167 | 2,189 |
| **13.75** | 3,382 | 3,409 | 3,435 | 3,462 | 3,488 | 3,515 | 3,541 |
| **16.25** | 4,705 | 4,736 | 4,768 | 4,799 | 4,831 | 4,862 | 4,894 |
| **18.75** | 6,027 | 6,064 | 6,100 | 6,137 | 6,173 | 6,210 | 6,246 |

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

**TABLE 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS**

Klamath Basin-Tulelake 2023

ANNUAL EQUIPMENT COSTS

| | Price | Years Life | Salvage Value | Capital Recovery | Cash Overhead | | Total |
|---|---|---|---|---|---|---|---|
| | | | | | Insurance | Taxes | |
| 225 HP 4WD Tractor | 245,388 | 15 | 166,864 | 20,299 | 174 | 2,061 | 22,534 |
| 175 HP 4WD Tractor | 175,833 | 15 | 119,566 | 14,545 | 125 | 1,477 | 16,147 |
| 125 HP 4WD Tractor | 115,412 | 15 | 78,480 | 9,547 | 82 | 969 | 10,598 |
| Subsoiler16' 9 Shank | 42,400 | 5 | 25,440 | 5,917 | 29 | 339 | 6,285 |
| Stubble Disc 16' | 45,000 | 5 | 27,000 | 6,280 | 30 | 360 | 6,670 |
| Rotospike - 15" | 29,000 | 10 | 17,400 | 2,870 | 20 | 232 | 3,121 |
| Chisel - 21' | 20,000 | 10 | 12,000 | 1,979 | 13 | 160 | 2,153 |
| Ring Roller 16' | 18,000 | 10 | 10,800 | 1,781 | 12 | 144 | 1,937 |
| Flail Mower 15' | 13,203 | 10 | 7,922 | 1,306 | 9 | 106 | 1,421 |
| Bed Shaper - 15' 5 Rov | 10,500 | 10 | 6,300 | 1,039 | 7 | 84 | 1,130 |
| Potato Digger-Harvest | 120,000 | 12 | 72,000 | 11,083 | 81 | 960 | 12,124 |
| Planter 5 Row 15' | 53,000 | 10 | 9,373 | 6,868 | 26 | 312 | 7,206 |
| Cultivator-Sled Close S | 11,000 | 10 | 6,600 | 1,088 | 7 | 88 | 1,184 |
| Cultivator Sled 5 Row | 9,500 | 8 | 5,700 | 1,035 | 6 | 76 | 1,118 |
| Potato Truck 15 Ton # | 20,000 | 5 | 13,600 | 2,513 | 14 | 168 | 2,695 |
| Potato Truck 15 Ton # | 20,000 | 5 | 13,600 | 2,513 | 14 | 168 | 2,695 |
| Potato Truck 15 Ton # | 20,000 | 5 | 13,600 | 2,513 | 14 | 168 | 2,695 |
| Potato Truck 15 Ton # | 20,000 | 5 | 13,600 | 2,513 | 14 | 168 | 2,695 |
| Elevator | 55,000 | 5 | 33,000 | 7,676 | 37 | 440 | 8,153 |
| Holding Tub | 70,000 | 5 | 42,000 | 9,769 | 47 | 560 | 10,376 |
| Pickup 3/4 Ton #1 | 32,000 | 5 | 21,760 | 4,021 | 23 | 269 | 4,312 |
| Pickup 1/2 Ton #1 | 28,000 | 5 | 19,040 | 3,518 | 20 | 235 | 3,773 |
| #1 ATV | 8,500 | 5 | 5,780 | 1,068 | 6 | 71 | 1,145 |
| Service Truck#2 | 120,000 | 10 | 81,600 | 11,179 | 85 | 1,008 | 12,272 |
| Spray Boom - 25' | 3,630 | 5 | 2,178 | 507 | 2 | 29 | 538 |
| Total | 1,305,366 | | 825,203 | 133,427 | 898 | 10,653 | 144,978 |
| 60% of New Cost* | 783,220 | | 495,122 | 80,056 | 539 | 6,392 | 86,987 |

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

**TABLE 5. CONTINUED WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS**

Klamath Basin-Tulelake 2023

ANNUAL INVESTMENT COSTS

| | | | | | Cash Overhead | | | |
|---|---|---|---|---|---|---|---|---|
| Investment | Price | Years Life | Salvage Value | Capital Recovery | Insurance | Taxes | Repairs | Total |
| Building 2400 sq ft | 25,000 | 25 | - | 2,145 | 11 | 125 | 500 | 2,781 |
| Fuel Tanks 2-500, 1000 gal | 21,950 | 20 | 2,195 | 2,018 | 10 | 121 | 439 | 2,588 |
| Pipe Trailer (10) | 35,000 | 10 | 3,500 | 4,730 | 16 | 193 | 700 | 5,639 |
| 125 Hp Booster Pumps(2) | 39,838 | 10 | 3,984 | 5,384 | 18 | 219 | 797 | 6,418 |
| Semi-Truck & Lowbed | 95,000 | 15 | 3,617 | 10,287 | 42 | 493 | 1,900 | 12,721 |
| Implement Carrier | 16,700 | 15 | 1,670 | 1,767 | 8 | 92 | 334 | 2,201 |
| GPS Guidence System | 8,500 | 10 | 850 | 1,149 | 4 | 47 | 170 | 1,369 |
| Shop Tools | 20,000 | 20 | 2,000 | 1,839 | 9 | 110 | 400 | 2,358 |
| Solid Set | 72,404 | 20 | 7,240 | 6,658 | 34 | 398 | 1,448 | 8,538 |
| Total Investment | 334,392 | | 25,056 | 35,976 | 152 | 1,797 | 6,688 | 44,613 |

ANNUAL BUSINESS OVERHEAD COSTS

| Description | Units/Farm | Units | Price/Unit | Total |
|---|---|---|---|---|
| Land Rent-Potatoes | 200 | Acre | 550 | 110,000 |
| Field Sanitation | 1,500 | Acre | 2 | 3,000 |
| Field Supervisor Salary | 1,500 | Acre | 55 | 82,500 |
| GPS Auto-TracActivation | 1,500 | Farm | 2 | 3,500 |
| Liability Insurance | 1,500 | Acre | 1 | 1,545 |
| Office Expense | 1,500 | Acre | 75 | 112,500 |
| Regulatory Compliance | 1,500 | Acre | 55 | 82,500 |

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

**TABLE 6. HOURLY EQUIPMENT COSTS**

Klamath Basin-Tulelake 2023

| | | | HOURLY EQUIPMENT COSTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Cash Overhead | | Operating | | | |
| Description | Total Hours Used | Potatoes Hours Used | Capital Recovery | Insurance | Taxes | Lube and Repairs | Fuel | Total Operating | Total Costs/Hr |
| 225 HP 4WD Tractor | 1066 | 329 | 11.43 | 0.10 | 1.16 | 13.92 | 53.54 | 67.46 | 80.14 |
| 175 HP 4WD Tractor | 1066 | 167 | 8.19 | 0.07 | 0.83 | 10.47 | 41.64 | 52.11 | 61.20 |
| 125 HP 4WD Tractor | 1066 | 287 | 5.37 | 0.05 | 0.55 | 7.23 | 29.74 | 36.98 | 42.94 |
| Subsoiler16' 9 Shank | 400 | 61 | 8.88 | 0.04 | 0.51 | 9.80 | - | 9.80 | 19.23 |
| Stubble Disc 16' | 400 | 27 | 9.42 | 0.05 | 0.54 | 7.56 | - | 7.56 | 17.57 |
| Rotospike - 15" | 150 | 48 | 11.48 | 0.08 | 0.93 | 8.36 | - | 8.36 | 20.84 |
| Chisel - 21' | 200 | 10 | 5.94 | 0.04 | 0.48 | 4.18 | - | 4.18 | 10.64 |
| Ring Roller 16' | 200 | 98 | 5.34 | 0.04 | 0.43 | 2.03 | - | 2.03 | 7.85 |
| Flail Mower 15' | 200 | 31 | 3.92 | 0.03 | 0.32 | 5.41 | - | 5.41 | 9.67 |
| Bed Shaper - 15' 5 Row | 200 | 39 | 3.12 | 0.02 | 0.25 | 2.16 | - | 2.16 | 5.55 |
| Potato Digger-Harvester 4 Row | 400 | 153 | 16.62 | 0.12 | 1.44 | 23.88 | - | 23.88 | 42.07 |
| Planter 5 Row 15' | 150 | 48 | 27.47 | 0.11 | 1.25 | 14.03 | - | 14.03 | 42.85 |
| Cultivator-Sled Close 5 Row | 150 | 31 | 3.27 | 0.02 | 0.26 | 2.26 | - | 2.26 | 5.81 |
| Cultivator Sled 5 Row | 150 | 31 | 2.48 | 0.02 | 0.18 | 2.01 | - | 2.01 | 4.69 |
| Potato Truck 15 Ton #1 | 400 | 110 | 3.77 | 0.02 | 0.25 | 4.26 | 15.38 | 19.64 | 23.68 |
| Potato Truck 15 Ton #2 | 400 | 110 | 3.77 | 0.02 | 0.25 | 4.26 | 15.38 | 19.64 | 23.68 |
| Potato Truck 15 Ton #3 | 400 | 110 | 3.77 | 0.02 | 0.25 | 4.26 | 15.38 | 19.64 | 23.68 |
| Potato Truck 15 Ton #4 | 400 | 110 | 3.77 | 0.02 | 0.25 | 4.26 | 15.38 | 19.64 | 23.68 |
| Elevator | 400 | 200 | 11.51 | 0.06 | 0.66 | 7.67 | - | 7.67 | 19.90 |
| Holding Tub | 400 | 200 | 14.65 | 0.07 | 0.84 | 9.76 | - | 9.76 | 25.33 |
| Pickup 3/4 Ton #1 | 400 | 44 | 6.03 | 0.03 | 0.40 | 3.68 | 8.79 | 12.47 | 18.94 |
| Pickup 1/2 Ton #1 | 400 | 44 | 5.28 | 0.03 | 0.35 | 3.11 | 6.94 | 10.05 | 15.71 |
| #1 ATV | 400 | 44 | 1.60 | 0.01 | 0.11 | 0.69 | 3.70 | 4.39 | 6.10 |
| Service Truck#2 | 200 | 37 | 33.54 | 0.25 | 3.02 | 13.69 | 15.38 | 29.07 | 65.88 |
| Spray Boom - 25' | 300 | 34 | 1.01 | 0.00 | 0.06 | 0.99 | - | 0.99 | 2.06 |

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

**TABLE 7. OPERATIONS WITH EQUIPMENT & MATERIALS**

Klamath Basin-Tulelake 2023

| Operation | Operation Month | Tractor | Implement | Labor Type | Labor Hours/Acre | Material/Custom | Rate/Acre | Unit |
|---|---|---|---|---|---|---|---|---|
| Chop Residue 80% Ac | Nov | 125 HP 4WD Tracto | Flail Mower 15' | Machine | 0.18 | | 0.15 | |
| Stubble Disc & Roll | Nov | 225 HP 4WD Tracto | Stubble Disc 16' | Machine | 0.16 | | 0.16 | |
| Stubble Disc & Roll | Nov | | Ring Roller 16' | Machine | | | | |
| Sub-Soil 50% Ac | Nov | 225 HP 4WD Tracto | Subsoiler16' 9 Sha | Machine | 0.36 | | 0.18 | |
| Sub-Soil 50% Ac | Nov | | Ring Roller 16' | Machine | | | | |
| Pre-Irrigation/Sprinklers | Nov | | | | | Water-Pumped | 0.5 | Acln |
| Roto-Spike/Fall-Fumigat | Nov | 175 HP 4WD Tracto | Rotospike - 15" | Machine | 0.12 | Vapam HL | 6.25 | Gal |
| Gypsum 25% Ac | Nov | | | | | Gypsum Hauled-Spr | 0.25 | Ton |
| Chisel & Roll | April | 225 HP 4WD Tracto | Chisel - 21' | Machine | 0.06 | | | |
| Chisel & Roll | April | | Ring Roller 16' | | | | | |
| Roto-spike/Spring-Fumig | April | 175 HP 4WD Tracto | Rotospike - 15" | Machine | 0.17 | | | |
| Roto-spike/Spring-Fumig | April | | | | | Vapam HL | 16.25 | Gal |
| Fertilize-Pre-Plant | May | | | | | 16-20-0-24% S | 100 | Lb |
| Fertilize-Pre-Plant | May | | | | | 10-34-0 | 20 | Gal |
| Fertilize-Pre-Plant | May | | | | | Potash | 200 | Lb |
| Pull Beds | May | 175 HP 4WD Tracto | Bed Shaper - 15' 5 | Machine | 0.24 | | | |
| Pull Beds | May | | | | | Eptam 7E | 1.75 | Pint |
| Plant Potatoes | May | 225 HP 4WD Tracto | Planter 5 Row 15' | Machine | 0.29 | Seed Potatoes-Trea | 22 | Cwt |
| At Planting-Fungicide | May | | | | | Quadris | 10 | FlOz |
| At Planting-Fungicide | May | | | | | Vydate L | 2 | Pint |
| Irrigation Labor | May | | | Irrigation | 10.00 | | 10 | |
| Irrigate/Sprinklers | July | | | Irrigation | | Water-Pumped | 6 | Acln |
| Irrigate/Sprinklers | Aug | | | Irrigation | | Water-Pumped | 4.5 | Acln |
| Irrigate/Sprinklers | Sept | | | Irrigation | | Water-Pumped | 2 | Acln |
| Cultivate/Hilling | May | | | | | Prowl H2O | 2 | Pint |
| Cultivate/Hilling | May | | | | | Sencor 4 | 4 | Oz |
| Chemigation-Disease | June | | | | | Ridomil Gold Bravo | 2 | Lb |
| Chemigation-Disease | July | | | | | Luna Tranquility | 10 | FlOz |
| Herbicide post emergenc | June | 175 HP 4WD Tracto | Spray Boom - 25' | Machine | 0.32 | Matrix SG | 2 | Oz |
| Chemigation-Insects | July | | | | | Movento | 2 | FlOz |
| Insects-Broadcast | Aug | | | | | Application Air 20G | 1 | Acre |
| Insects-Broadcast | Aug | | | | | Movento | 2 | FlOz |
| Disease-Broadcast | Aug | | | | | Application Air 20G | 1 | Acre |
| Disease-Broadcast | Aug | | | | | Tanos | 10 | Cwt |
| Growth Regulator | Aug | | | | | Application Air 20G | 0.5 | Acre |
| Growth Regulator | Aug | | | | | Royal MH-30 | 1 | Gal |
| Petiole Samples | Sept | | | | | Petiole Samples | 1 | Acre |
| 1/2 Ton Pickup Truck | Sept | Pickup 1/2 Ton #1 | | Machine | 0.24 | | | |
| 3/4 Ton Pickup Truck | Sept | Pickup 3/4 Ton #1 | | Machine | 0.24 | | | |
| ATV4WD | Sept | #1 ATV | | Machine | 0.24 | | | |
| Service Truck | Sept | Service Truck#2 | | Machine | 0.20 | | | |
| Desiccant Application | Sept | | | | | Application Air 20G | 0.5 | Acre |
| Desiccant | Sept | | | | | Reglone Desiccant | 1 | Pint |
| Cut Vines/Roll Beds | Sept | 125 HP 4WD Tracto | Cultivator Sled 5 F | Machine | 0.18 | | | |
| Dig/Harvest Potatoes | Oct | 225 HP 4WD Tracto | Potato Digger-Har | Machine | 0.92 | Harvest | | Ton |
| Bulk Potatoes | Oct | | | Non-Machine | 2.00 | | | |
| Haul Potatoes | Oct | Potato Truck 15 To | | Machine | 0.60 | Haul (ton) | | Ton |
| Haul Potatoes | Oct | Potato Truck 15 To | | | 0.60 | Haul (ton) | | Ton |
| Haul Potatoes | Oct | Potato Truck 15 To | | | 0.60 | Haul (ton) | | Ton |
| Haul Potatoes | Oct | Potato Truck 15 To | | | 0.60 | Haul (ton) | | Ton |
| Assessments/Fees | Oct | | | | | CPRAB | 535 | Cwt |
| Elevate/Holding Tub | Oct | 125 HP 4WD Tracto | Elevator | Machine | 2.20 | | | |
| Shed-Store Potatoes | Oct | | Holding Tub | | | Store Potatoes-Proc | 535 | Cwt |
| Treat For Sprouts | Oct | | | | | StorOx | 4 | Pint |