
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2006

**SAMPLE COSTS TO PRODUCE
SWEETPOTATOES**



**TRANSPLANT and FIELD PRODUCTION
SAN JOAQUIN VALLEY
Merced County**

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STUDY CONTENTS

INTRODUCTION.....	2
ASSUMPTIONS.....	3
Hotbed Operating Costs.....	3
Production Operating Costs.....	5
Labor, Equipment and Interest Costs.....	9
Cash Overhead	9
Non-Cash Overhead	10
REFERENCES	12
Table 1. HOTBED COSTS PER ACRE to PRODUCE SWEETPOTATO TRANSPLANTS.....	13
Table 2. HOTBED COSTS AND RETURNS PER ACRE	15
Table 3. HOTBED MONTHLY CASH COSTS PER ACRE.....	16
Table 4. HOTBED OPERATIONS WITH EQUIPMENT & MATERIALS.....	18
Table 5. COSTS PER ACRE TO PRODUCE SWEETPOTATOES.....	19
Table 6. COSTS AND RETURNS PER ACRE TO PRODUCE SWEETPOTATOES.....	21
Table 7. MONTHLY CASH COSTS PER ACRE TO PRODUCE SWEETPOTATOES	23
Table 8. RANGING ANALYSIS – YIELD & PRICES	25
Table 9. RANGE OF PRICES OVER PERCENT SHRINKAGE BY MONTH.....	27
Table 10. OPERATIONS WITH EQUIPMENT & MATERIALS	29
Table 11. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT AND OVERHEAD COSTS.....	30
Table 12. HOURLY EQUIPMENT COSTS	32

INTRODUCTION

Sample costs to produce sweetpotato transplants in hotbeds and sweetpotatoes in the San Joaquin Valley are shown in this study. The study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. The practices described are based on production operations considered typical for this crop and region, but will not apply to every farm. Sample costs for labor, materials, equipment and custom services are based on current figures. “Your Costs” columns in Tables 1, 2, 5 and 6 are provided for entering your farm costs.

The hypothetical farm operations, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, California, (530) 752-3589 or the local UC Cooperative Extension office.

Sample Cost of Production Studies for many commodities can be downloaded at <http://coststudies.ucdavis.edu>, requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-4424 or obtained from the local county UC Cooperative Extension offices. Some archived studies are also available on the website.

ASSUMPTIONS

The assumptions refer to Tables 1 to 12 and pertain to sample costs to produce sweetpotato transplants and sweetpotatoes in the San Joaquin Valley. The cultural practices described represent production operations and materials considered typical for a farm in the region. Costs, materials, and practices in this study will not apply to all farms. Timing of and types of cultural practices will vary among growers within the region and from season to season due to variables such as weather, soil, and insect and disease pressure. **The use of trade names and cultural practices 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 or cultural practices.**

Farm. This report is based on a 200 non-contiguous acre farm managed by the grower. The farm is planted to sweetpotatoes and orchards. The farm is located on the valley floor on sandy to sandy loam soil (the preferred soil for sweetpotatoes). The grower owns 120 acres and rents 80 acres of which 75 are planted to sweetpotatoes and 1.25 acres are hotbeds for growing transplants. Each sweetpotato field is 25 planted acres. The remaining rented acreage is roads, irrigation system, and open areas. Roads and buildings occupy approximately five acres of the owned land.

Transplant Production (Hotbeds) Operating Costs

Tables 1 - 4

Hotbed Location. Hotbeds are used to grow slips (plant cuttings) for transplanting to the field. They may be placed on both owned and rented ground (rented in this study). In some operations, the grower may grow transplants for others, however this is not common. In this study, it is assumed that the grower is producing transplants only for his own operation. Land for the hotbed area covers 1.25 acres. Hotbed areas must have access to a well, because district water may be unavailable in February. Soils chosen for the beds are generally sandy to loamy sand in texture.

Hotbed Land Preparation. In late fall and winter, the area for the hotbeds is prepared by chiseling and disking. The land is then leveled with a triplane, fumigated, amended with fertilizers and/or compost, and beds dug in preparation for planting.

Fumigation. The field is fumigated and tarped by a custom operator using a 53% methyl bromide (MeBr) and 47% chloropicrin (Pic) blend for nematode, insect, and weed control. After two to three weeks, the tarp is mechanically cut open to allow the field to air out, then removed and taken to the dump. The field is then disked once to vent the ground. Because of alleys and field borders, the fumigated area is slightly more than double the area planted to the beds. For this study, the total fumigated area is 1.25 acres, and is based on an average hot bed to field acre ratio of 1:62.

Environmental Protection Agency (EPA) requirements to comply with the Montreal protocol may severely restrict or eliminate the use of methyl bromide; this fumigant may be unavailable after 2005. Currently, the sweetpotato industry in California is operating under a Critical Use Exemption permit that allows use of methyl bromide. This permit will expire in 2005, and may not be renewed. Fumigation alternatives include tarped Telone (1,3-D) plus chloropicrin, flood metam sodium (Vapam), or solarization. Telone + Pic product and application costs are similar to MeBr + Pic.

Plant. Potatoes are started in hotbeds that can be heated from decomposing cotton gin trash, or they can be started in cold beds without heat. For this study, hot beds are utilized. The hotbeds are planted in February

using seed saved from the previous season (medium grade) and some purchased virus-tested seed. For this study, it is assumed that purchased virus-tested seed comprises 25% of the total seed requirements. The grower produced seed is assumed to have a value of \$0.10 per pound. Common varieties in the region are Diane (red-skinned), Beauregard (copper-skinned), Hanna and Golden Sweet (tan), and Japanese.

Plant beds are 8-feet wide with 10-feet between beds giving a total row width of 18-feet. The beds are plowed out (excavated to a depth of 12 to 14-inches), then gin trash at 1.25 truck loads per acre is placed in the bed by five men with pitchforks working six hours. The gin trash is then packed in two passes with the grower's tractor and roller, irrigated and covered with soil using a tractor and mechanical dirt thrower. Pre-heated sweetpotato roots are hauled from storage and placed in the beds by hand, then covered with more soil. About one-half acre of planted area, or one acre of fumigated area is required to produce transplants for 62 acres of field production.

It takes approximately 500 to 800 pounds of medium-sized potatoes to furnish enough cuttings (sometimes called slips) or transplants (so called when they are pulled from the beds) for one acre of crop, depending on variety. Because of low plant production and a 9-inch in-row field plant spacing, Beauregard usually requires the most space (about 50 feet of bed for each field acre), whereas Hanna requires the least (about 25 feet of bed required). For this study, it is assumed that 35 linear feet of hotbed planted area and 800 pounds of potato seed are needed to produce enough transplants for one acre on a 9-inch spacing (17,500 plants). Planting time is assumed to be 308 man-hours per acre, which includes a 10 man crew and a foreman. The forklift operator drives both the truck and the forklift.

Tunnels. After planting, clear plastic tunnels are placed over the beds to protect the plants from frost and encourage rapid growth. Reusable metal rods or hoops are placed every 3 to 4 feet down the bed, and then plastic is pulled over the hoops. One edge is covered with dirt to hold the plastic in place, the other edge is held in place with dirt filled bags placed every six-feet. Depending on the weather, the bags are set aside daily to uncover the plants. It takes 2.75 man-hours per acre each day to uncover the beds and an equal amount of time to re-cover. Typically, tunnels must be used until May.

Irrigation. During bed preparation, aluminum pipe is laid to irrigate or moisten the gin trash and is assumed to take four man hours to haul and lay the pipe, irrigate, and remove the pipe. After covering the sweetpotatoes in the beds, the irrigation system is installed (PVC pipe and risers with sprinklers) by the grower's labor. The sprinklers are placed in alternate open areas between the beds so that each line will cover two beds (approximately 36-feet). Risers typically occur every 25 feet. The field is irrigated every three days for about twelve weeks at one hour per acre per irrigation. Because hotbeds typically begin before district water is available, well water is used. Water costs are included in the rent, but the grower pays the pumping or electrical charge. The estimated pumping cost is \$34.25 per acre foot (\$2.85 per acre inch).

Fertilization. Pre-plant fertilizer is applied after fumigating. A complete NPK formulation is used in this study (15-15-15 at 800 pounds per broadcast acre), though compost can be utilized as well and is often applied in conjunction with the fertilizer. The hot beds are also topdressed once in the spring by hand to supply the equivalent of about 30 pounds of nitrogen (N) per acre.

Topping. Prior to cutting plants for the field, many beds are trimmed using gas-powered "weed whackers" to encourage uniform height in the plants. Plant tops may be trimmed weekly from mid-April to harvest (about 4 weeks). It takes approximately two man-hours per week (4 men x 0.50 hours per acre) to trim the plants.

Pest Management. If insects or diseases appear, contact your local farm advisor or pest control adviser (PCA). For information on pesticide use permits, contact the local county agricultural commissioner's office. Adjuvants are recommended for many pesticides for effective control, but are not included in this study. Pesticide costs vary by location and grower volume. Pesticides costs in this study are taken from a single dealer and shown as full retail.

Weeds. The fumigation to control nematodes usually provides adequate weed control. Weed escapes are removed using hand labor.

Insects. Fumigation usually provides all the insect control needed. Aphids may be a problem in some years, and can be controlled with the registered insecticides Fulfill (pymetrozine), Actara (thiamethoxam) or Provado (imidacloprid), if needed. Armyworms can be controlled with Bt insecticides (Dipel, Xentari) or Intrepid if required. For this study, no insect control in the beds is suggested.

Diseases. The transplants are susceptible to many soilborne diseases. Use of fumigation and disease free seed can be an effective control. Scurf and other rots may be suppressed by spraying Botran (dichloran) or Mertect (thiabendazole) on the seed prior to covering with soil. For this study, fungicides are not used in the beds, however, transplants are dipped in fungicide solutions at cutting prior to field planting. Mertect is recommended as a plant dip at the rates of 8 fluid ounces per 7.5 gallons of water. Not all varieties or transplants require treatment, only the sweet and Japanese varieties which account for 30% of the market. In this study 30% of the transplants are treated. The plants are dipped for four minutes.

Cutting Plants. The beds may be cut twice for transplants, but in this study they are harvested once. Hot beds are ready to be harvested when the plants are about 12 inches in height. To limit the transfer of diseases or nematodes from the bed to the field, plants should be cut about 1 to 2 inches above the soil line, then gathered and placed into milk crates for transport to the field. Depending on variety, about 13,000 to 17,500 plants will be needed to plant one acre. One man can pull 1,000 to 1,200 plants per hour. Before going to the field, transplants are dipped in a fungicide solution (see above paragraph). In general, the plants cut from the hotbeds are transplanted within 24 hours. In this study, the truck driver operates the forklift in the field and makes two trips each day at one hour per trip to the production field.

Returns. It is assumed that all production from the hot beds will be used for planting in the field, with no sales to other growers. Therefore, there are no returns calculated for transplants. Growers using Enterprise Accounting may assign a return to the hotbed transplants.

Field Production Operating Costs

Tables 5 - 10

Field Location. Field locations chosen for sweetpotato production generally have sandy to loamy sand soils, as these soil types produce the best yield and quality. Additionally, soils need to be well drained and contain low levels of salt with a pH less than 7 and an electrical conductivity (EC) less than 2. Soil samples should be taken in the fall to help determine fertilizer and amendment rates.

Land Preparation. In the fall (November), fields are ripped in two directions by a custom operator and disked twice by the grower in preparation for fumigation. Conventionally grown sweetpotatoes are usually fumigated with Telone (1,3-D) at 12 – 14 gallons per acre. Applications are made in the fall or spring by a custom fumigation company (Telone is not applied in January). Telone use is restricted in buffer zones and by a California state mandated cap that limits the total amount of Telone that can be applied within a section of land. In areas where it cannot be used, alternatives include Mocap and Lorsban insecticides. In our scenario,

Telone is applied in the fall by a custom applicator. The grower then disks and rolls the ground in a single operation twice to seal the soil and prevent the loss of fumigant to the air. In the spring beginning in March, the cover crop is disked, compost applied, chiseled once, and springtoothed twice. Shortly before planting, the beds are pulled (listed) by a custom operator. Preplant fertilizers are applied at the same time the beds are made. Depending on plant date, fields may be pre-irrigated before the beds are pulled.

Cover Crop. In November or December, Merced Rye at 30 pounds per acre is planted. The rye is disked in March and/or April with two passes to incorporate the material into the soil.

Transplanting. The sweetpotato cuttings (slips) are cut from the hotbeds and transplanted in the field from mid-April through mid-June (May in this study). The grower transplants on 80-inch beds, two rows per bed at 9-inch down the row spacing (17,500 plants per acre). Most growers use a four-row planter that pulls a water tank (2,500 gal). Eight persons (two persons per row of potatoes to pick up the plant from a box and place in the machine) are on the planter and one or two following to stick in missed plants. A second tractor pulls a large nurse tank (2,500 gallons) to haul water to the field and fills the tank attached to the planter while on the move. Approximately, 2,000 to 3,000 gallons of water per acre are applied at transplanting. The cost of \$32.97 per thousand plants or \$577 per production acre for the transplants is from the Total Hotbed Cash Costs in Table 1.

Irrigation. Most sweetpotato fields are drip irrigated, although some furrow irrigation is still used. Both well and surface water are used; surface water requires the use of sand media filters, whereas the well water only needs screen filters. Pumps are powered by both diesel and electric motors. In this scenario, each field uses surface water with a portable 3-tank sand media filter and diesel motor. The pumps are included under Investments (Non-Cash Overhead) and the operation costs (fuel, lube) and maintenance costs are assumed to be included in Equipment Repairs in the tables under Cash Overhead. Other commonly used systems are surface water with a portable 3-tank sand media filter and electric motor; and well water with a screen filter system and electric motor. Surface water is supplied by the Merced Irrigation District (MID). Water costs are \$14.25 per acre-foot (\$1.18 per acre inch) plus \$27 per acre stand-by (paid by landlord).

The drip tape is laid on the soil surface in the center of the bed soon after planting. Because of root intrusion problems, the drip tape is not buried and used for only one season before being discarded. Drip tape is thin, typically 5 to 6 mil, and low flow (15 gallons per hour per 100 feet). The tape is laid using a drip tape machine with tractor covering three beds at a time, using one tractor driver and two men on the tape machine. Three men lay the lateral line and connect the drip. The field is irrigated according to the planting date and the water requirements of the crop. Initially the field may be irrigated weekly in May, then beginning in June, fields may be irrigated for approximately 8 to 12 hours everyday through August. Irrigation labor calculated from grower data is 0.05 hours per acre per irrigation. Irrigation includes the water costs per irrigation and irrigation labor to maintain the system. The crop uses approximately 30 to 36 acre-inches per season (2.5 to 3 acre ft).

Fertilizer/Soil Amendments. Soil samples for nutrient analysis are taken from each field prior to land preparation. Costs are shown for sample analysis, but not for collecting the sample. In this study, the sample is taken by a PCA or person with a similar position. Gypsum at one ton per acre is applied in November prior to chiseling. Composted manure is applied in March after the cover crop is incorporated and prior to chiseling. Phosphorous (P), potassium (K), and zinc (Zn) are applied pre-plant when pulling the beds; rates should be based on a soil test. A portion of the nitrogen (N) is also applied at this time, with the majority applied through the drip tape after transplanting. In this scenario, 80 gallons per acre (about 800 lbs) of 8-8-8 + Zn is applied in a band under each plant row before transplanting. Supplemental nitrogen is applied in-season (June and July) using 20 gallons of UAN32 (60 lbs N per acre) equally divided among the applications. Fertilizer is applied

through the drip tape when irrigating beginning 4 to 6 weeks after transplanting. A total of 120 pounds of fertilizer N is applied to the crop.

Pest Management. If insects or diseases appear, contact your local farm advisor or pest control adviser (PCA). For information on pesticide use permits, contact the local county agricultural commissioner's office. Adjuvants are recommended for many pesticides for effective control, but are not included in this study. Pesticide costs vary by location and grower volume. Pesticides costs in this study are taken from a single dealer and shown as full retail.

Weeds. Weeds are controlled with mechanical cultivation, hand weeding, and careful use of selective herbicides. Fumigation prior to planting may also provide some weed control. Fields are generally cultivated with a rolling or standard cultivator two weeks after planting (May) followed with two more cultivations at two-week intervals (June). One month to 6 weeks after transplanting, bed middles can be sprayed with a band application of Roundup (glyphosate) to control emerged weeds under the drip tape. Hand weeding is usually needed three times during the season, in June and July. Post-emergence (July) control of grassy weeds is accomplished with broadcast applications of Poast (sethoxydim), Fusilade (fluazifop), or Prism (clethodim) plus a crop oil concentrate.

Insects and nematodes. The most problematic insects in California sweetpotato production include armyworms, grubs, and wireworms. Western Yellowstripe Armyworms (*Spodoptera spp.*) may be a problem in some years, though treatment is usually not required in all fields. In this study, Intrepid (methoxyfenozide) is air applied for worm control in early August on one-half of the acreage. The Morning Glory Leafminer (*Bedellia somulenta*) is sometimes seen each year, but usually arrives too late in the season to require management. Wireworms (*Limoniuss spp.*) and grubs (Scarab beetles) can be very problematic in certain fields and because of their life cycles, are difficult to control. Previous history of this problem, high organic matter, new ground (from pasture or orchard), and wet zones/over irrigation will increase the likelihood of problems and the need for control measures. Fumigation can provide good suppression of these insects. Lorsban (chlorpyrifos) and Mocap (ethoprop) may be shanked and incorporated into those areas that cannot be fumigated, and may provide some control. Root knot nematodes (*Meloidogyne incognita*) are common in most of the sandy soils where sweetpotatoes are grown and can be very problematic. Nematodes are best controlled with fumigation and resistant varieties. Some varieties, such as Beauregard, are very susceptible. Newer varieties, such as Bienville and Covington, are moderately resistant to root knot nematode and are recommended for organic fields.

Diseases. Depending on variety, the transplants are susceptible to many soilborne diseases. Use of disease free seed and cutting transplants above the ground can be an effective way to limit the spread of Scurf (*Monilochaetes infuscans*), Pox (*Streptomyces sp*), and Black Rot (*Ceratocistis fimbriata*). Transplant dips using Benlate (registration inactive) or Mertect will reduce the incidence of Stem Rot (*Fusarium sp*) in susceptible varieties such as Koto Buki and Golden Sweet. Telone fumigation for nematode and insect control will also provide some suppression of field diseases, though efficacy is not sufficient to suppress *Fusarium*. Pre-irrigating late planted fields and maintaining a soil pH less than 5.7 will also help control Soil Pox (*Streptomyces ipomoea*). Soil pH can be adjusted by applying lime or sulfur in the fall. Newer varieties have greater resistance to most field diseases. Plants in this study are treated with Mertect at cutting and the cost is included as a hotbed operation.

Sweetpotato Feathery Mottle Virus causes the disease Russet Crack and can lead to significant losses of yield and quality in the variety Beauregard after only 4 years. Other varieties are also susceptible but may not show symptoms as quickly. This disease is transmitted by aphids and is best controlled by using clean, virus-

tested plants either purchased directly from Foundation Plant Services in Davis, CA or purchasing new seed (G1) from a reliable grower.

Pickup. Costs for two 1/2-ton pickups are included in the study. The pickups are used by the grower and/or irrigator to inspect the fields and general ranch business. The calculations in the study are estimated and do not represent results from any collected data.

Harvest. Prior to digging the crop, the drip tape and laterals are removed by hand, then the crop canopy is removed using a flail mower followed by a vine cutter. One vine tractor can keep up with 10 diggers. The drip tape is hauled to the landfill and the laterals are stored. The crop is harvested with a tractor drawn potato harvester (PTO digger chain lifts potatoes). The potatoes are removed from the chain by hand, and sorted by size into one of eight bins located on the digger. For this scenario, five people on the digger are sorting into Number 1, Jumbo, and Medium size classes. For the 75 acres, the grower owns and uses two diggers. Costs also include the use of a forklift in the field to lift the boxes on and off the digger and to load them on a truck to haul to the storage warehouse. Another forklift at the warehouse is used to unload and stack the full bins and to reload the truck with empty bins for the field. The truck driver operates both forklifts. Depending on the grade of sweetpotato, a bin weighs 800 to 900 pounds when full. Most of the crop (90%) is stored prior to packing. Curing is no longer a common practice, and is not included as a cost in this study. A water truck makes several trips over the field roads each day to water the roads in order to reduce dust emissions.

Yields. Based on the 2000 – 2003 Merced County crop report, the crop yields an average of 13 marketable tons per acre (650 forty pound boxes per acre). The sweetpotatoes are sold by grade size: U.S. No. 1s, Mediums, and Jumbos. The grades are based on size and freedom from defects; U.S. No. 1s bring the highest returns for the grower and usually account for about 60% of the pack-out yield. Yields decline in storage from losses due to postharvest disease and dehydration; typical losses are about 2% per month after the first month. The average yield shown in this study takes the seasonal dehydration into account.

Returns. Based on Merced County crop reports, the overall average return for years 1999 to 2003 is \$550 per ton FOB shed (\$11 per 40 pound box). These returns reflect fresh market sales (no processing) and packing costs that have not been deducted. Packing costs are typically \$4.00 per 40 pound box. Prices received vary by variety, grade, and time of year. The Ranging Analysis Table (Table 8) shows production costs over a range of yields as well as net returns over operating costs, cash costs and total costs over the same range of prices and yields. Table 9, Range of Prices Over Percent Shrinkage by Month shows how returns are affected by shrinkage based on the average cost study yield of 650 boxes. For this table, it is assumed the yield at harvest is 706.50 boxes and that the average shrink over the season is 8% based on a shrinkage rate of 2% per month. The Gross Returns table shows Gross Returns FOB packing shed. The Net Returns table, subsections of Table 9 show the net returns based on the production and packing costs for the 650 box yield as shown in Table 8.

Assessments. The California Sweetpotato Council helps unite growers and packers for the benefit of the entire industry. The Council distributes promotional material, sponsors a National Meeting, and funds the clean seed program. Membership in the council is voluntary and the cost is \$5.00 per production acre. The cost is included in this study under Cash Overhead.

Packing Charges. Packing charges are typically about \$4.00 per 40 pound box, but are not included as a cost in the general study. To calculate net returns in Tables 8 and 9, packing charges are shown and included as a cost.

Labor, Equipment, and Interest Costs

Labor. Labor rates of \$11.82 per hour for machine operators and \$9.73 for general labor includes payroll overhead of 39%. The basic hourly wages are \$8.50 for machine operators and \$7.00 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for potato crops (code 0041), and a percentage for other possible benefits. Workers' compensation costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2005 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Tables 1 and 5 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 American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum power takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$2.00 and \$2.55 per gallon, respectively. The cost includes a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 1 and 5 are determined by multiplying the total hourly operating cost in Table 12 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 9.25% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last 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 January 2006.

Risk. Production risks should not be minimized. 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 the profitability and economic viability.

Cash Overhead

Table 11

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, and investment repairs.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis.

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.70% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$733 for the entire farm.

Office Expense. Office and business expenses are estimated at \$100 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, and legal fees for the sweetpotato part of the whole farm. The cost is a general estimate and not based on any actual data.

Land Rent. Land rents in Merced County depending on the irrigation district in 2005 (Trends and Leases) ranged from \$100 to \$250 per acre. Land rents according to growers in the area ranged from \$375 to \$400 per acre. For this study, \$375 is the rental value and the landowner pays the basic monthly water service charge and the grower pays the cost for the water used. The hotbeds are planted prior to surface water availability in the canals, so rent is \$475 per acre and includes pump use with the renter paying the pumping or electrical costs.

Sanitation Rental. The cost includes double unit toilets with washbasins, delivered and serviced weekly. The toilets are rented for three months beginning in mid-February for the hotbeds and again for six months beginning in April for the production field. The costs are allocated accordingly.

Investment Repairs. Annual maintenance on Investments is calculated as 2% of the purchase price, except for the portable pumps. Fuel and maintenance costs are included for the portable pumps and calculated as 15% of the new cost.

Non-Cash Overhead

Tables 11 – 12

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments.

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). 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 formula for the calculation of the annual capital recovery costs is $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$.

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 the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in the tables.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate used and the life of the machine.

Interest Rate. The interest rate of 6.25% is used to calculate capital recovery. The rate will vary depending upon size of loan and other lending agency conditions, but is a suggested rate by a farm lending agency in January 2006.

Building. The metal building(s) are on a cement slab and total approximately 2,400 square feet. The buildings are used for shops and equipment storage. The buildings are located on the grower owned land.

Warehouse. The 9,600 square foot metal insulated building is used for potato storage. It also includes evaporative coolers for maintaining storage temperature. The warehouse is located on the grower owned land.

Seedhouse/General Warehouse. The seedhouse is a 500 square foot metal building on a cement slab. Potatoes removed from storage for seed and new seed potatoes purchased are warmed in this building for a couple of weeks prior to planting. The house is heated with a propane heater and the propane costs are assumed to be included in the Investment Repairs under Cash Overhead. During other times of the year the building is used for other storage or use.

Coolers. Five evaporative coolers are installed on the roof of the potato storage warehouse.

Bins. The bins are used for crop storage in the warehouse and each holds approximately 800 to 900 pounds of potatoes. Thirty-six hundred bins are owned by the grower – 2,400 are wood and 1,200 are plastic. Bins require some annual maintenance and these costs are included in Investment Repairs. Seventy-five bins are used part-time for seed storage and this cost is allocated to the hotbeds.

Land. Cropland in the region ranges from \$2,500 per acre to \$15,000 per acre, depending upon irrigation where the land is located. In this study, we assume the land is in the Merced Irrigation District (MID) and is valued between \$5,000 and \$9,000 per acre. The value is not shown for land, because the potatoes are grown on rented land.

Tools. This includes shop tools, hand tools, and miscellaneous field tools. The tools are an estimated value and not taken from any specific data.

Irrigation/Laterals. The grower purchases drip tape for the beds annually and owns the lateral lines that connect to the drip tape. The drip tape is included in the production costs and the laterals under non-cash overhead. Each field is assumed to be 25 acres with 0.25-mile runs (field length) and require 33 feet of lateral lines per acre for a total of 2,500 linear feet. Drip tape is taken to the landfill for disposal.

Portable Pumps. Three 50 horse power (HP) diesel booster pumps with 3-tank sand media filters, one in each field, are used to pump the surface water and supply the water to each field. Annual maintenance and fuel is assumed to cost 15% of the purchase price and is included in Investment repairs under Cash Overhead.

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 the Whole Farm Annual Equipment, Investment, and Business Overhead Costs table. 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.

REFERENCES

- Agricultural Commissioner. *Crop Reports 2004*. Agricultural Commissioner, Merced County, Merced, CA.
- American Society of Agricultural Engineers. 1994. *American Society of Agricultural Engineers Standards Yearbook*. Russell H. Hahn and Evelyn E. Rosentreter (ed.) St. Joseph, Missouri. 41st edition.
- Barker, Doug. 2005. *California Workers' Compensation Rating Data for Selected Agricultural Classifications as of January 1, 2005*. California Department of Insurance, Rate Regulation Branch.
- Boehlje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, New York
- California Chapter of the American Society of Farm Managers and Rural Appraisers. 2005. *Trends in Agricultural Land and Lease Values*. California Chapter of the American Society of Farm Managers and Rural Appraisers, Inc. Woodbridge, CA.
- California State Automobile Association. 2005. *Gas Price Survey 2005*. AAA Public Affairs, San Francisco,
- May, Don, and Bob Scheuerman. 1998. *Sweet Potato Production In California*. University of California, Division of Agriculture and Natural Resources. Publication 7237.
- Minges, P. A., L. L. Morris. *Sweet Potato Production and Handling in California*. 1953. University of California, Division of Agricultural Sciences. Circular 431.
- Sweetpotato Council of California. 2005. *History of California Sweetpotato Council*. <http://www.cayam.com>. April 8, 2006.

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UC COOPERATIVE EXTENSION
Table 1. HOTBED COSTS PER ACRE TO PRODUCE SWEETPOTATO TRANSPLANTS
 SAN JOAQUIN VALLEY – Merced County 2006

Operation*	Operation	Field	Cash and Labor Costs per Acre				Total Cost	Your Cost
	Time (Hrs/A)	Labor (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent		
Cultural:								
Land Prep: Rip 2X (Custom)	0.00	0.00	0	0	0	48	48	
Land Prep: Disk 2X	0.30	0.00	4	7	0	0	11	
Land Prep: Triplane	0.25	0.00	4	6	0	0	10	
Fumigate: (Custom)	0.00	0.00	0	0	0	2,100	2,100	
Fumigate: Cut Tarp (mechanical)	0.40	0.00	6	4	0	0	9	
Fumigate: Remove/Haul Tarp	1.00	21.00	219	13	0	31	262	
Fumigate: Disk 1X to vent ground	0.15	0.00	2	4	0	0	6	
Fertilize: Broadcast (15-15-15)	0.13	0.00	2	2	118	0	121	
Fertilize: Disk (incorporate fertilizer)	0.15	0.00	2	4	0	0	6	
Plant: Open Beds (3 passes)	0.83	0.00	12	15	0	0	27	
Plant: Spread Gin Trash (hand)	0.00	30.00	292	0	0	813	1,104	
Plant: Pack Trash 2X	0.61	0.00	9	6	0	0	14	
Irrigate: Water Gin Trash	1.00	1.00	43	13	1	0	57	
Plant: Throw Dirt	1.08	0.00	15	10	0	0	26	
Plant: Haul Potatoes to Field	8.00	0.00	113	101	0	0	215	
Plant: Potato Seed+Labor	20.00	308.00	3,281	159	8,060	0	11,499	
Irrigate: Install Sprinkler System (labor)	0.00	16.00	156	0	0	0	156	
Tunnels: Install	0.00	32.00	311	0	626	0	937	
Irrigate: Sprinkle	0.00	30.00	292	0	51	0	343	
Fertilize: Hand Spreader (21-0-0)	0.00	1.00	10	0	3	0	12	
Tunnels: Cover/Uncover	0.00	319.50	3,109	0	0	0	3,109	
Trim Tops 4X	0.00	8.00	78	0	0	0	78	
Pickup Use	1.00	0.00	14	8	0	0	22	
TOTAL CULTURAL COSTS	34.90	766.50	7,973	350	8,859	2,992	20,173	
Harvest:								
Harvest: Cut Plants	45.00	1,089.00	11,234	358	0	0	11,592	
Disease: Fungicide Dip (Mertect)	0.00	0.00	0	0	1,185	0	1,185	
Harvest: Haul	24.00	0.00	340	303	0	0	644	
TOTAL HARVEST COSTS	69.00	1,089.00	11,575	661	1,185	0	13,420	
Interest on operating capital @ 9.25%							720	
TOTAL OPERATING COSTS/ACRE	103.90	1,855.50	19,547	1,011	10,043	2,992	34,313	
CASH OVERHEAD:								
Rent - Land							475	
Office Expense							100	
Sanitation Rental							640	
Liability Insurance							4	
Property Taxes							91	
Property Insurance							63	
Investment Cash Costs (repairs, fuel, lube, electricity, etc.)							88	
TOTAL CASH OVERHEAD COSTS							1,461	
TOTAL CASH COSTS/ACRE							35,774	
CASH COST PER FIELD TRANSPLANTED ACRE ¹							577	
CASH COST PER THOUSAND PLANTS PRODUCED ²							32.97	
CASH COST PER LINEAR FOOT (8 ft bed with 10 ft alley) ³							16.49	

UC COOPERATIVE EXTENSION
Table 1. HOTBED COSTS CONTINUED
 SAN JOAQUIN VALLEY – Merced County 2006

Operation*	Operation Time (Hrs/A)	Field Labor (Hrs/A)	Cash and Labor Costs per Acre				Total Cost	Your Cost
			Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
Cultural:								
Non-Cash Overhead (Capital Recovery)			Per Producing Acre			Annual Cost Capital Recovery		
Buildings: Shop/Miscellaneous			360			27	27	
Buildings: Seedhouse/General Use			75			6	6	
Bins: Wood (75)			64			9	9	
Irrigation: PVC pipe & sprinklers			1,556			214	214	
Tools Field/Shop			60			8	8	
Bed Trimmers (2)			900			493	493	
Metal Hoops (800)			1,400			192	192	
Equipment			11,864			1,100	1,100	
TOTAL NON-CASH OVERHEAD COSTS			16,279			2,049	2,049	
TOTAL COSTS/ACRE							37,823	
TOTAL COST PER FIELD TRANSPLANTED ACRE ¹							610	
TOTAL COST PER THOUSAND PLANTS PRODUCED ²							34.86	
TOTAL COST PER LINEAR FOOT (8ft bed with 10ft alley) ³							17.43	

*Word before colon (:) is paragraph heading in text

¹ Hotbed acre to Transplanted Acre = 1: 62

² Calculation assumes 1,085,000 plants produced per hotbed acre

³ Calculation assumes 2,170 linear feet per hotbed acre

UC COOPERATIVE EXTENSION

Table 2. HOTBED COST AND RETURNS PER ACRE TO PRODUCE SWEETPOTATO TRANSPLANTS
SAN JOAQUIN VALLEY – Merced County 2006

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Sweetpotato Transplants (no sales, used on farm)	0.00	ton	0.00	0	
OPERATING COSTS					
Custom:					
Chisel	2.00	acre	24.00	48	
Fumigate - Shank	1.00	acre	2,100.00	2,100	
Landfill Fee	1,241.00	lb	0.03	31	
Miscellaneous Materials					
Gin Trash (Material + Hauling)	1.25	acre	650.00	813	
Plastic for Tunnels	6.80	rolls	92.00	626	
Seed:					
Sweetpotatoes (grower owned)	37,200.00	lb	0.10	3,720	
Sweetpotatoes (new)	12,400.00	lb	0.35	4,340	
Fertilizer:					
15-15-15	800.00	lb	0.15	118	
21-0-0 (Ammonium Sulfate)	26.40	lb	0.10	3	
Fungicide:					
Mertect 340-F (applied to 30% of acres)	461.00	floz	2.57	1,185	
Irrigation:					
Water (pumping charge)	18.50	acin	2.85	53	
Labor (machine)	124.68	hrs	11.82	1,474	
Labor (non-machine)	1,857.50	hrs	9.73	18,073	
Fuel - Diesel	328.49	gal	2.00	657	
Lube				99	
Machinery repair				256	
Interest on operating capital @ 9.25%				720	
TOTAL OPERATING COSTS/ACRE				34,313	
NET RETURNS ABOVE OPERATING COSTS				-34,313	
CASH OVERHEAD COSTS:					
Rent - Land				475	
Office Expense				100	
Sanitation Rental				640	
Liability Insurance				4	
Property Taxes				91	
Property Insurance				63	
Investment Cash Costs (repairs, fuel, lube, electricity, etc.)				88	
TOTAL CASH OVERHEAD COSTS/ACRE				1,461	
TOTAL CASH COSTS/ACRE				35,774	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings: Shop/Miscellaneous				27	
Buildings: Seedhouse/General Use				6	
Bins: Wood (75)				9	
Irrigation: PVC pipe & sprinklers				214	
Tools Field/Shop				8	
Bed Trimmers (2)				493	
Metal Hoops (800)				192	
Equipment				1,100	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				2,049	
TOTAL COSTS/ACRE				37,823	
NET RETURNS ABOVE TOTAL COSTS				-37,823	

UC COOPERATIVE EXTENSION
Table 3. HOTBED MONTHLY CASH COST PER ACRE TO PRODUCE SWEETPOTATO TRANSPLANTS
 SAN JOAQUIN VALLEY – Merced County 2006

Beginning NOV 05	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 06	05	05	06	06	06	06	06	06	06	06	06	06	
Cultural:													
Land Prep: Rip 2X (Custom)	48												48
Land Prep: Disk 2X	11												11
Land Prep: Triplane		10											10
Fumigate: (Custom)			2,100										2,100
Fumigate: Cut Tarp (mechanical)			9										9
Fumigate: Remove/Haul Tarp			262										262
Fumigate: Disk 1X to vent ground			6										6
Fertilize: Broadcast (15-15-15)			121										121
Fertilize: Disk (incorporate fertilizer)			6										6
Plant: Open Beds (3 passes)			27										27
Plant: Spread Gin Trash (hand)			1,104										1,104
Plant: Pack Trash 2X			14										14
Irrigate: Water Gin Trash			57										57
Plant: Throw Dirt				26									26
Plant: Haul Potatoes to Field				215									215
Plant: Potato Seed+Labor				11,499									11,499
Irrigate: Install Sprinkler System (labor)				156									156
Tunnels: Install				937									937
Irrigate: Sprinkle				29	114	114	86						343
Fertilize: Hand Spreader (21-0-0)				12									12
Tunnels: Cover/Uncover				375	1,605	1,129							3,109
Trim Tops 4X						39	39						78
Pickup Use	3	3	3	3	3	3	3						22
TOTAL CULTURAL COSTS	63	13	3,710	13,251	1,723	1,285	128	0	0	0	0	0	20,173
Harvest:													
Harvest: Cut Plants							11,592						11,592
Disease: Fungicide Dip (Mertect)							1,185						1,185
Harvest: Haul							644						644
TOTAL HARVEST COSTS	0	0	0	0	0	0	13,420	0	0	0	0	0	13,420
Interest on operating capital @ 9.25%	0	1	29	131	145	155	259					0	720
TOTAL OPERATING COSTS/ACRE	63	14	3,739	13,382	1,868	1,440	13,807	0	0	0	0	0	34,313

UC COOPERATIVE EXTENSION
Table 3. HOTBED MONTHLY CASH COSTS CONTINUED
 SAN JOAQUIN VALLEY – Merced County 2006

Beginning NOV 05	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 06	05	05	06	06	06	06	06	06	06	06	06	06	
OVERHEAD:													
Rent - Land		475											475
Office Expense	8	8	8	8	8	8	8	8	8	8	8	8	100
Sanitation Rental				160	160	160	160						640
Liability Insurance			4										4
Property Taxes		45				45							91
Property Insurance			32						32				63
Investment Cash Costs (repairs, fuel, lube, electricity, etc.)	7	7	7	7	7	7	7	7	7	7	7	7	88
TOTAL CASH OVERHEAD COSTS	16	536	51	176	176	221	176	16	47	16	16	16	1,461
TOTAL CASH COSTS/ACRE	79	550	3,791	13,558	2,043	1,661	13,983	16	47	16	16	16	35,774

UC COOPERATIVE EXTENSION
Table 4. HOTBED OPERATIONS WITH EQUIPMENT and MATERIALS
 SAN JOAQUIN VALLEY – Merced County 2006

Operation	Operation Month	Equipment Tractor	Implement	Non-Mach Labor hrs/acre	Material	Broadcast Rate/acre	Unit
Cultural:							
Land Prep: Chisel 2X (Custom)	November	Custom					
Land Prep: Disk 2X	November	125HP	Disk 12'				
Land Prep: Triplane	December	125HP	Triplane 16'				
Land Prep: Fumigate (Custom)	January	Custom			Includes Materials		
Land Prep: Cut Tarp (mechanical)	January	60HP	Knife-Sickle				
Land Prep: Remove/Haul Tarp	January	Truck Flatbed		21.00			
Land Prep: Disk 1X to vent	January	125HP	Disk 12'				
Fertilize: Broadcast (15-15-15)	January	60HP	Fertilizer Spreader		15-15-15	800.00	lb
Land Prep: Open Beds (3 passes)	January	105HP	Bed Opener				
Land Prep: Spread Gin Trash	January			30.00	Gin Trash	1.25	load
Land Prep: Pack Trash 2X	January	60HP	Roller - Flat 8'				
Irrigate: Irrigate Trash (includes haul & move pipe)	January	Truck Flatbed		3.00	Water	0.50	acin
Land Prep: Throw Dirt	February	60HP	Dirt Thrower				
Land Prep: Throw Dirt (after planting)	February	60HP	Dirt Thrower				
Plant: Haul Potatoes to Field	February	Truck Flatbed					
Plant: Potato Seed+Labor	February	Forklift Field		308.00	Grower Seed	37,200.00	lb
					New Seed	12,400.00	lb
Irrigate: Install Sprinkler System	January			16.00	*Pipe & Sprinkler		
Tunnels: Install	February			32.00	Plastic	6.80	rolls
					*Hoops	800.00	each
Irrigate:	February			2.50	Water	1.50	acin
	March			10.00	Water	6.00	acin
	April			10.00	Water	6.00	acin
	May			7.50	Water	4.50	acin
Fertilize: (21-0-0) Hand Spreader	February			1.00	21-0-0	26.40	lb
Tunnels: Cover/Uncover	February			38.50			
	March			165.00			
	April			116.00			
Trim Tops (Weeder+Labor) 4X	April		*Bed Trimmer	4.00			
	May		*Bed Trimmer	4.00			
Pickup Use	Annual	Pickup					
Harvest: Cut Plants	May	Forklift		1,089.00			
Harvest: Fungicide Dip (30% of harvested transplants)	May				Mertect	461.00	floz
Harvest: Haul to Production Field	May	Truck Flatbed					

*Material listed under Non-Cash Overhead (Investments)

UC COOPERATIVE EXTENSION
Table 5. COST PER ACRE TO PRODUCE SWEETPOTATOES
 SAN JOAQUIN VALLEY – Merced County 2006

Operation	Operation Time (Hrs/A)	Field Labor (Hrs/A)	Cash and Labor Costs per Acre				Total Cost	Your Cost
			Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
Cultural:								
Fertilize: Soil Sample (3) - Custom	0.00	0.00	0	0	0	4	4	
Fertilize: Soil Amendment (Gypsum) Custom	0.00	0.00	0	0	60	0	60	
Land Prep: Chisel 2X - Custom	0.00	0.00	0	0	0	48	48	
Land Prep: Disk 2X	0.14	0.00	2	3	0	0	5	
Fumigate: Custom (Telone)	0.00	0.00	0	0	254	40	294	
Land Prep: Disk & Roll 2X	0.29	0.00	4	7	0	0	11	
Cover Crop: Plant (Rye)	0.20	0.00	3	5	14	0	22	
Cover Crop: Disk 2X	0.29	0.00	4	7	0	0	11	
Fertilize: (Composted Manure) Custom	0.00	0.00	0	0	27	10	37	
Land Prep: Chisel 1X - Custom	0.00	0.00	0	0	0	24	24	
Land Prep: Disk & Roll 1X	0.14	0.00	2	4	0	0	6	
Land Prep: Springtooth 2X	0.14	0.00	2	3	0	0	5	
Land Prep: List - Custom. Fertilize: (8-8-8+Zn)	0.00	0.00	0	0	91	20	111	
Plant: Sweetpotatoes	3.95	20.00	251	89	577	0	916	
Irrigate: Lay Drip Tape & Laterals	0.65	1.30	22	10	131	0	163	
Irrigate: Water & Labor	0.00	4.00	39	0	35	0	74	
Weed: Cultivate 3X	0.29	0.00	4	6	0	0	10	
Fertilize: Through Drip Line (UN32)	0.00	0.00	0	0	30	0	30	
Weed: Hand 3X	0.00	31.50	306	0	0	0	306	
Weed: Banded over drip line (Roundup)	0.14	0.00	2	2	3	0	7	
Weed: Broadcast (Prism)	0.22	0.00	3	2	30	0	36	
Insect: Worms (Intrepid) 50% acres by air	0.00	0.00	0	0	10	9	19	
Pickup Use	4.00	0.00	57	32	0	0	89	
TOTAL CULTURAL COSTS	10.45	56.80	701	169	1,264	155	2,289	
Harvest:								
Harvest: Drip Tape/Laterals Removal	0.26	5.00	52	3	0	2	56	
Harvest: Mow Vines	0.25		3	4	0	0	7	
Harvest: Cut Vines	0.30		4	3	0	0	7	
Harvest: Dig Potatoes	10.00	50.00	628	174	0	0	803	
Harvest: Haul to Storage (includes forklift operations)	5.00		71	46	0	0	117	
Harvest: Water Truck	1.00		14	10	0	0	24	
TOTAL HARVEST COSTS	16.81	55.00	773	239	0	2	1,014	
Interest on operating capital @ 9.25%							113	
TOTAL OPERATING COSTS/ACRE	27.26	111.80	1,475	409	1,264	157	3,417	
CASH OVERHEAD:								
Rent – Land (per producing acre)							393	
Office Expense							100	
Sanitation Rental							16	
Liability Insurance							4	
California Sweetpotato Council Assessment							5	
Property Taxes							65	
Property Insurance							45	
Investment Cash Costs (repairs, fuel, lube, electricity, etc.)							275	
TOTAL CASH OVERHEAD COSTS							902	
TOTAL CASH COSTS/ACRE							4,318	

UC COOPERATIVE EXTENSION
Table 5. COST PER ACRE CONTINUED
 SAN JOAQUIN VALLEY – Merced County 2006

Operation	Operation Time (Hrs/A)	Field Labor (Hrs/A)	Cash and Labor Costs per Acre				Total Cost	Your Cost
			Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
NON-CASH OVERHEAD/Investments (Capital Recovery):			Per Producing		Annual Cost			
			<u>Acres</u>		<u>Capital Recovery</u>			
Buildings: Shop/Miscellaneous			360		27		27	
Warehouse: Potato Storage			4,480		334		334	
Seedhouse/General Use			75		6		6	
Bins: Plastic (1200)			1,920		264		264	
Bins: Wood (2325)			2,015		277		277	
Bins: Wood (75)			64		9		9	
Laterals for Drip 2500 ft'			50		7		7	
Evaporative Coolers (5) for Warehouse			213		16		16	
Tools: Field/Shop			60		8		8	
Pump: Portable 50HP (3)			600		53		53	
Equipment			2,530		280		280	
TOTAL NON-CASH OVERHEAD COSTS			12,367		1,281		1,281	
TOTAL COSTS/ACRE							5,599	

UC COOPERATIVE EXTENSION
Table 6. COSTS AND RETURNS PER ACRE TO PRODUCE SWEETPOTATOES
 SAN JOAQUIN VALLEY – Merced County 2006

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Sweetpotatoes	650.00	box	11.00	7,150	
OPERATING COSTS					
Custom:					
Soil Samples	0.04	each	100.00	4	
Chisel	3.00	acre	24.00	72	
Fumigate - Shank	1.00	acre	40.00	40	
Spread Compost	1.00	ton	10.00	10	
List Beds	1.00	acre	20.00	20	
Helicopter (insecticide application)	0.50	acre	18.00	9	
Disposal Fee (drip tape)	60.00	lb	0.03	2	
Fungicide:					
Telone II	12.00	gal	21.20	254	
Seed:					
Merced Rye (cover crop)	30.00	lb	0.48	14	
Sweetpotatoes Transplants (Hotbed Cash Cost)	17.50	thou	32.97	577	
Fertilizer/Soil Amendments:					
Gypsum (includes delivery & spread)	1.00	ton	60.00	60	
Compost (Chicken Manure)	1.00	ton	27.00	27	
8-8-8	816.00	lb	0.11	86	
Zinc 9%	0.50	gal	9.21	5	
UAN 32	60.00	lb N	0.50	30	
Irrigation:					
Drip Tape	6,534.00	ft	0.02	131	
Water Surface	30.00	acin	1.18	35	
Insecticide:					
Intrepid 2F (applied to 1/2 of the acres)	4.00	floz	2.57	10	
Herbicide:					
Prism	1.50	pint	20.16	30	
Roundup Ultra Max	0.38	pint	8.50	3	
Labor (machine)	32.70	hrs	11.82	387	
Labor (non-machine)	111.84	hrs	9.73	1,088	
Fuel - Gas	0.00	gal	2.55	0	
Fuel - Diesel	127.57	gal	2.00	255	
Lube				38	
Machinery repair				115	
Interest on operating capital @ 9.25%				113	
TOTAL OPERATING COSTS/ACRE				3,417	
NET RETURNS ABOVE OPERATING COSTS				3,734	
CASH OVERHEAD COSTS:					
Rent – Land (per producing acre)				393	
Office Expense				100	
Sanitation Rental				16	
Liability Insurance				4	
California Sweetpotato Council Assessment				5	
Property Taxes				65	
Property Insurance				45	
Investment Cash Costs (repairs, fuel, lube, electricity, etc.)				275	
TOTAL CASH OVERHEAD COSTS/ACRE				902	
TOTAL CASH COSTS/ACRE				4,318	

UC COOPERATIVE EXTENSION
Table 6. COST AND RETURNS CONTINUED
 SAN JOAQUIN VALLEY – Merced County 2006

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings: Shop/Miscellaneous				27	
Warehouse: Potato Storage				334	
Seedhouse/General Use				6	
Bins: Plastic (1200)				264	
Bins: Wood (2325)				277	
Bins: Wood (75)				9	
Laterals for Drip 2500 ft'				7	
Evaporative Coolers (5) for Warehouse				16	
Tools: Field/Shop				8	
Pump: Portable 50HP (3)				53	
Equipment				280	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,281	
TOTAL COSTS/ACRE				5,599	
NET RETURNS ABOVE TOTAL COSTS (FOB Shed)				1,551	

UC COOPERATIVE EXTENSION
Table 7. MONTHLY CASH COST PER ACRE TO PRODUCE SWEETPOTATOES
 SAN JOAQUIN VALLEY – Merced County 2006

Beginning NOV 05	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 06	05	05	06	06	06	06	06	06	06	06	06	06	
Cultural:													
Fertilize: Soil Sample (3) - Custom	4												4
Fertilize: Soil Amendment (Gypsum) Custom	60												60
Land Prep: Chisel 2X - Custom	48												48
Land Prep: Disk 2X	5												5
Fumigate: Custom (Telone)	294												294
Land Prep: Disk & Roll 2X	6	6											11
Cover Crop: Plant (Rye)		22											22
Cover Crop: Disk 2X					11								11
Fertilize: (Composted Manure) Custom					37								37
Land Prep: Chisel 1X - Custom						24							24
Land Prep: Disk & Roll 1X						6							6
Land Prep: Springtooth 2X						5							5
Land Prep: List - Custom. Fertilize: (8-8-8+Zn)						111							111
Plant: Sweetpotatoes							916						916
Irrigate: Lay Drip Tape & Laterals							163						163
Irrigate: Water & Labor						4	28	29	14				74
Weed: Cultivate 3X						3	7						10
Fertilize: Through Drip Line (UN32)							15	15					30
Weed: Hand 3X							204	102					306
Weed: Banded over drip line (Roundup)							7						7
Weed: Broadcast (Prism)								36					36
Insect: Worms (Intrepid) 50% acres by air									19				19
Pickup Use	7	7	7	7	7	7	7	7	7	7	7	7	89
TOTAL CULTURAL COSTS	425	35	7	7	55	153	1,093	269	189	41	7	7	2,289
Harvest:													
Harvest: Drip Tape/Laterals Removal											56		56
Harvest: Mow Vines											7		7
Harvest: Cut Vines											7		7
Harvest: Dig Potatoes											803		803
Harvest: Haul to Storage (includes forklift operations)											117		117
Harvest: Water Truck											24		24
TOTAL HARVEST COSTS	0	0	0	0	0	0	0	0	0	0	1,014	0	1,014
Interest on operating capital @ 9.25%	3	4	4	4	4	5	14	16	17	18	25	0	113
TOTAL OPERATING COSTS/ACRE	428	38	11	11	59	158	1,107	285	206	58	1,047	7	3,417

UC COOPERATIVE EXTENSION
Table 7. MONTHLY CASH COSTS CONTINUED
 SAN JOAQUIN VALLEY – Merced County 2006

Beginning NOV 05	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 06	05	05	06	06	06	06	06	06	06	06	06	06	
OVERHEAD:													
Rent - Land											393		393
Office Expense	9	9	9	9	9	9	9	9	9	9	9		100
Sanitation Rental						3	3	3	3	3	3		16
Liability Insurance			4										4
California Sweetpotato Council Assessment												5	5
Property Taxes		32				32							65
Property Insurance			23						23				45
Investment Cash Costs (repairs, fuel, lube, electricity, etc.)	23	23	23	23	23	23	23	23	23	23	23	23	275
TOTAL CASH OVERHEAD COSTS	32	64	58	32	32	67	35	35	57	35	427	28	902
TOTAL CASH COSTS/ACRE	460	103	69	43	91	225	1,142	319	263	93	1,474	35	4,318

UC COOPERATIVE EXTENSION
Table 8. RANGING ANALYSIS
 SAN JOAQUIN VALLEY – Merced County 2006

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE SWEET POTATOES

	YIELD (40 lb boxes/acre)						
	400	525	650	775	900	1,025	1,150
OPERATING COSTS/ACRE:							
Cultural Cost	2,289	2,289	2,289	2,289	2,289	2,289	2,289
Harvest Cost (Pick & Haul)	911	963	1,014	1,066	1,117	1,169	1,221
Harvest: Pack*	1,600	2,100	2,600	3,100	3,600	4,100	4,600
Interest on operating capital @ 9.25%	112	113	113	114	114	114	115
<i>TOTAL OPERATING COSTS/ACRE</i>	4,912	5,465	6,016	6,569	7,120	7,672	8,225
<i>TOTAL OPERATING COSTS/box</i>	12.28	10.41	9.26	8.48	7.91	7.48	7.15
CASH OVERHEAD COSTS/ACRE							
<i>TOTAL CASH COSTS/ACRE</i>	5,812	6,366	6,918	7,471	8,023	8,575	9,129
<i>TOTAL CASH COSTS/box</i>	14.53	12.13	10.64	9.64	8.91	8.37	7.94
NON-CASH OVERHEAD COSTS/ACRE							
<i>TOTAL COSTS/ACRE</i>	7,078	7,640	8,199	8,757	9,314	9,870	10,428
<i>TOTAL COSTS/box</i>	17.70	14.55	12.61	11.30	10.35	9.63	9.07

*Packing costs not included in operating capital calculation.

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/box	YIELD (40 lb boxes/acre)						
	400	525	650	775	900	1,025	1,150
5	-2,912	-2,840	-2,766	-2,694	-2,620	-2,547	-2,475
7	-2,112	-1,790	-1,466	-1,144	-820	-497	-175
9	-1,312	-740	-166	406	980	1,553	2,125
11	-512	310	1,134	1,956	2,780	3,603	4,425
13	288	1,360	2,434	3,506	4,580	5,653	6,725
15	1,088	2,410	3,734	5,056	6,380	7,703	9,025
17	1,888	3,460	5,034	6,606	8,180	9,753	11,325
19	2,688	4,510	6,334	8,156	9,980	11,803	13,625

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE \$/box	YIELD (40 lb boxes/acre)						
	400	525	650	775	900	1,025	1,150
5	-3,812	-3,741	-3,668	-3,596	-3,523	-3,450	-3,379
7	-3,012	-2,691	-2,368	-2,046	-1,723	-1,400	-1,079
9	-2,212	-1,641	-1,068	-496	77	650	1,221
11	-1,412	-591	232	1,054	1,877	2,700	3,521
13	-612	459	1,532	2,604	3,677	4,750	5,821
15	188	1,509	2,832	4,154	5,477	6,800	8,121
17	988	2,559	4,132	5,704	7,277	8,850	10,421
19	1,788	3,609	5,432	7,254	9,077	10,900	12,721

UC COOPERATIVE EXTENSION
Table 8. RANGING ANALYSIS CONTINUED
 SAN JOAQUIN VALLEY – Merced County 2006

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE \$/box	YIELD (40 lb boxes/acre)						
	400	525	650	775	900	1,025	1,150
5	-5,078	-5,015	-4,949	-4,882	-4,814	-4,745	-4,678
7	-4,278	-3,965	-3,649	-3,332	-3,014	-2,695	-2,378
9	-3,478	-2,915	-2,349	-1,782	-1,214	-645	-78
11	-2,678	-1,865	-1,049	-232	586	1,405	2,222
13	-1,878	-815	251	1,318	2,386	3,455	4,522
15	-1,078	235	1,551	2,868	4,186	5,505	6,822
17	-278	1,285	2,851	4,418	5,986	7,555	9,122
19	522	2,335	4,151	5,968	7,786	9,605	11,422

UC COOPERATIVE EXTENSION

Table 9. RANGE OF PRICES OVER PERCENT SHRINKAGE BY MONTH FOR SWEET POTATOES*

SAN JOAQUIN VALLEY – Merced County 2006

GROSS RETURNS – FOB PACKING SHED

Month:	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Price	% Shrink								
\$/box	0	2	4	6	8	10	12	14	16
5	3,533	3,462	3,391	3,321	3,250	3,179	3,109	3,038	2,967
7	4,946	4,847	4,748	4,649	4,550	4,451	4,352	4,253	4,154
9	6,359	6,231	6,104	5,977	5,850	5,723	5,595	5,468	5,341
11	7,772	7,616	7,461	7,305	7,150	6,994	6,839	6,683	6,528
13	9,185	9,001	8,817	8,633	8,450	8,266	8,082	7,899	7,715
15	10,598	10,386	10,174	9,962	9,750	9,538	9,326	9,114	8,902
17	12,011	11,770	11,530	11,290	11,050	10,809	10,569	10,329	10,089
19	13,424	13,155	12,887	12,618	12,350	12,081	11,813	11,544	11,276

NET RETURNS ABOVE OPERATING COSTS**

Month:	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Price	% Shrink								
\$/box	0	2	4	6	8	10	12	14	16
5	-2,484	-2,554	-2,625	-2,695	-2,766	-2,837	-2,907	-2,978	-3,049
7	-1,071	-1,169	-1,268	-1,367	-1,466	-1,565	-1,664	-1,763	-1,862
9	343	215	88	-39	-166	-293	-421	-548	-675
11	1,756	1,600	1,445	1,289	1,134	978	823	667	512
13	3,169	2,985	2,801	2,617	2,434	2,250	2,066	1,883	1,699
15	4,582	4,370	4,158	3,946	3,734	3,522	3,310	3,098	2,886
17	5,995	5,754	5,514	5,274	5,034	4,793	4,553	4,313	4,073
19	7,408	7,139	6,871	6,602	6,334	6,065	5,797	5,528	5,260

NET RETURNS ABOVE CASH COSTS**

Month:	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Price	% Shrink								
\$/box	0	2	4	6	8	10	12	14	16
5	-3,386	-3,456	-3,527	-3,597	-3,668	-3,739	-3,809	-3,880	-3,951
7	-1,973	-2,071	-2,170	-2,269	-2,368	-2,467	-2,566	-2,665	-2,764
9	-560	-687	-814	-941	-1,068	-1,195	-1,323	-1,450	-1,577
11	854	698	543	387	232	76	-79	-235	-390
13	2,267	2,083	1,899	1,715	1,532	1,348	1,164	981	797
15	3,680	3,468	3,256	3,044	2,832	2,620	2,408	2,196	1,984
17	5,093	4,852	4,612	4,372	4,132	3,891	3,651	3,411	3,171
19	6,506	6,237	5,969	5,700	5,432	5,163	4,895	4,626	4,358

UC COOPERATIVE EXTENSION
Table 9. RANGE OF PRICES OVER PERCENT SHRINKAGE CONTINUED
 SAN JOAQUIN VALLEY – Merced County 2006

NET RETURNS ABOVE TOTAL COSTS**

Month:	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Price	% Shrink								
\$/box	0	2	4	6	8	10	12	14	16
5	-4,667	-4,737	-4,808	-4,878	-4,949	-5,020	-5,090	-5,161	-5,232
7	-3,254	-3,352	-3,451	-3,550	-3,649	-3,748	-3,847	-3,946	-4,045
9	-1,841	-1,968	-2,095	-2,222	-2,349	-2,476	-2,604	-2,731	-2,858
11	-428	-583	-738	-894	-1,049	-1,205	-1,360	-1,516	-1,671
13	986	802	618	434	251	67	-117	-300	-484
15	2,399	2,187	1,975	1,763	1,551	1,339	1,127	915	703
17	3,812	3,571	3,331	3,091	2,851	2,610	2,370	2,130	1,890
19	5,225	4,956	4,688	4,419	4,151	3,882	3,614	3,345	3,077

*See Returns under Production in text. Yield and Returns based on average of 650 boxes or 706.5 boxes at September harvest

**Production costs are from Table 8, "Costs Per Acre at Varying Yields to Produce Sweetpotatoes", 650 boxes per acre column.

The appropriate production cost (Table 8) subtracted from the Gross Income (Table 9) = Net Returns

UC COOPERATIVE EXTENSION
Table 10. OPERATIONS WITH EQUIPMENT and MATERIALS
 SAN JOAQUIN VALLEY – Merced County 2006

Operation	Operation Month	Equipment Tractor	Implement	Non-Mach Labor hrs/acre	Material	Broadcast Rate/acre	Unit
Cultural:							
Fertilize: Soil Sample (3 samples/75 acres)	November	Custom			Sample	0.04	each
Fertilize: Gypsum	November	Custom			Gypsum	1.00	ton
Land Prep: Chisel 2X	November	Custom					
Land Prep: Disk	November	125HP MFWD	Disk 12'				
Land Prep: Fumigate - Custom (Telone)	November	Custom			Telone	12.00	gal
Land Prep: Disk & Roll 2X	November	125HP MFWD	Disk & Ring Roller				
	December	125HP MFWD	Disk & Ring Roller				
Cover Crop: Plant	December	105HP MFWD	Drill - Grain		Merced Rye	30.00	lb
Cover Crop: Disk 2X	March	125HP MFWD	Disk				
Fertilize: Manure	March	Custom			Compost	1.00	ton
Land Prep: Chisel 1X	April	Custom					
Land Prep: Disk & Roll 1X	April	125HP MFWD	Disk & Ring Roller				
Land Prep: Springtooth 2X	April	105HP MFWD	Springtooth				
Land Prep: List - Custom. Fertilize:	April	Custom - List			39,668 Zinc	816.00 0.50	lb gal
Plant: Sweet Potatoes	May	125HP MFWD	Transplanter	20.00	Transplants	17.50	thou
			Water Wagon 1000 g				
		105HP MFWD	Water Wagon 2500 g				
Irrigate: Drip Tape Install	May	105HP MFWD	Drip Tape Machine	0.80	Drip Tape	6,534.00	ft
Irrigate: Drip Tape Install Laterals	May	75HP MFWD	Blade - Rear	0.50			
Irrigate: Water & Labor	May			0.20	Water	1.50	acin
	June			1.50	Water	11.25	acin
	July			1.50	Water	11.63	acin
	August			0.80	Water	5.62	acin
Fertilize: through drip	June				UAN 32	30.00	lb N
	July				UAN 32	30.00	lb N
Weed: Cultivate 3X	May	105HP MFWD	Cultivator - Rolling				
	June	105HP MFWD	Cultivator - Rolling				
	June	105HP MFWD	Cultivator - Rolling				
Weed: Hand 3X	June			10.50			
	June			10.50			
	July			10.50			
Weed: Spray (15" band over dripline)	June	75HP MFWD	Weed Sprayer Shielded		Roundup	0.38	pint
Weed: Spray	July	60HP MFWD	Weed Sprayer 100g		Prism	1.50	pint
Insect: Worm (Intrepid) Air 50% of the acres	August	Custom	Helicopter		Intrepid	4.00	floz
Cleanup: Drip Tape/Laterals	Sept	60HP MFWD	Drip Tape Machine	5.00	Drip Tape	60.00	lb
		Truck					
Harvest: Mow Vines	Sept	75HP MFWD	Mower-Flail				
Harvest: Cut Vines	Sept	60HP MFWD	Vine Cutter				
Harvest: Dig	Sept	75HP MFWD	Digger 1-row	25.00			
		105HP MFWD	Digger 1-row	25.00			
Harvest: Haul	Sept	Forklift - Field					
		Forklift - Slab					
		Truck					
Harvest: Water Roads	Sept	Truck-Water					

UC COOPERATIVE EXTENSION

Table 11. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
SAN JOAQUIN VALLEY – Merced County 2006

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
06	105HP MFWD Tractor	55,000	15	10,708	5,304.46	229.98	328.54	5,863
06	125HP MFWD Tractor	80,000	15	15,575	7,715.59	334.51	477.87	8,528
06	60HP MFWD Tractor	34,000	15	6,619	3,279.14	142.17	203.10	3,624
06	75HP MFWD Tractor	40,000	15	7,787	3,857.82	167.25	238.94	4,264
06	Bed Dirt Thrower	5,000	40	23	342.69	17.58	25.12	385
06	Bed Opener	2,000	40	9	137.08	7.03	10.04	154
06	Blade-Rear 3pt 6'	1,200	15	115	120.73	4.60	6.58	132
06	Cultivator Rolling 21'	7,000	25	198	557.18	25.19	35.99	618
06	Digger 1-Row 80" #1	18,500	6	5,333	3,032.06	83.42	119.17	3,235
06	Digger 1-Row 80" #2	18,500	6	5,333	3,032.06	83.42	119.17	3,235
06	Disk 12'	12,000	15	1,152	1,207.26	46.03	65.76	1,319
06	Drill-Grain 12'	21,000	15	2,016	2,112.70	80.56	115.08	2,308
06	Drip Machine 1 Row - 80"	3,800	15	365	382.29	14.58	20.83	418
06	Fertilizer Rig - Broadcast	10,000	20	521	875.84	36.82	52.60	965
06	Forklift-Field	25,000	20	3,208	2,139.17	98.73	141.04	2,379
06	Forklift-Slab	38,000	20	4,876	3,251.54	150.07	214.38	3,616
06	Knife-Sickle 5'	500	40	2	34.27	1.76	2.51	39
06	Mower - Flail 7'	9,600	10	1,698	1,192.51	39.54	56.49	1,289
06	Pickup 1/2 ton	32,000	10	9,452	3,690.69	145.08	207.26	4,043
06	Pickup 1/2 ton #2	32,000	10	9,452	3,690.69	145.08	207.26	4,043
06	Roller-Flat 8'	1,800	20	94	157.64	6.63	9.47	174
06	Roller-Ring 21'	6,700	40	30	459.55	23.56	33.65	517
06	Springtooth Harrow 20'	5,000	40	23	342.69	17.58	25.12	385
06	Transplanter 4R 2 Bed 13'	15,000	10	2,653	1,863.30	61.79	88.27	2,013
06	Triplane 16'	19,000	30	292	1,413.92	67.52	96.46	1,578
06	Truck 16' bed, 16 bin	52,000	10	15,360	5,997.33	235.76	336.80	6,570
06	Truck - Water	52,000	10	15,360	5,997.33	235.76	336.80	6,570
06	Vine Cutter 7'	2,000	40	9	137.08	7.03	10.04	154
06	Water Wagon 2,500 gal #2	13,000	20	678	1,138.57	47.87	68.39	1,255
06	Water Wagon 2,500 gal #1	13,000	20	678	1,138.57	47.87	68.39	1,255
06	Weed Sprayer 100g 13'	3,947	15	379	397.08	15.14	21.63	434
06	Weed Spryer w/Shield 20'	10,000	15	960	1,006.05	38.36	54.80	1,099
TOTAL		638,547		120,958	66,005	2,658	3,798	72,461
60% of New Cost *		383,128		72,575	39,603	1,595	2,279	43,476

*Used to reflect a mix of new and used equipment

UC COOPERATIVE EXTENSION
Table 11 CONTINUED
 SAN JOAQUIN VALLEY – Merced County 2006

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Bed Trimmers (2)	900	2	0	493	3	5	18	518
Bins: Plastic (1200)	144,000	10	0	19,797	504	720	2,880	23,901
Bins: Wood (2325)	151,125	10	0	20,777	529	756	3,022	25,083
Bins: Wood (75) Used also for seed	4,875	10	0	670	17	24	98	810
Buildings - Shop/Storage (2400 sqft)	72,000	30	0	5,371	252	360	1,440	7,423
Coolers - Evaporative for warehouse (5)	16,000	30	0	1,194	56	80	320	1,650
Laterals Irrigation: 2500 ft for drip	3,750	10	0	516	13	19	75	622
Metal Hoops (800) for Hotbed tunnels	1,400	10	0	192	5	7	28	232
Irrigation: PVC Pipe & Sprinklers for Hotbeds	1,556	10	0	214	5	8	31	258
Portable Pumps (3) 50HP for Production fields	45,000	20	0	4,003	158	225	6,750	11,136
Seedhouse/General Storage. 500 sqft	15,000	30	0	1,119	53	75	300	1,547
Tools Field/Shop	12,000	10	0	1,650	42	60	240	1,992
Warehouse: 9600 sqft Potato Storage	336,000	30	0	25,067	1,176	1,680	6,720	34,643
TOTAL INVESTMENT	803,606		0	81,063	2,813	4,018	21,922	109,815

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/		Price/ Unit	Total Cost
	Farm	Unit		
Liability Insurance	200	acre	3.66	732
Office Expense	200	acre	100	20,000
Rent 1.5 acres (Hotbeds)	1.5	acre	475	713
Rent 78.5 acres (Production)	78.5	acre	375	29,438
Sanitation Rental 4 months (Hotbeds)	1.25	acre	640	800
Sanitation Rental 6 months (Production)	75	acre	16	1,200
Sweetpotato Council Assessment (Production)	75	acre	5	375

UC COOPERATIVE EXTENSION
Table 12. HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY – Merced County 2006

Yr	Description	Actual	Cash Overhead			Operating		Total	Total
		Hours	Capital	Insur-	Taxes	Repairs	Fuel & Lube		
		Used	Recovery	ance			Oper.	Costs/Hr.	
06	105HP MFWD Tractor	800	3.98	0.17	0.25	2.36	14.02	16.38	20.78
06	125HP MFWD Tractor	1,000	5.79	0.25	0.36	3.43	16.69	20.12	26.52
06	60HP MFWD Tractor	795	2.48	0.11	0.15	1.46	6.78	8.24	10.98
06	75HP MFWD Tractor	800	2.89	0.13	0.18	1.72	8.47	10.19	13.39
06	Bed Dirt Thrower	1	190.38	9.77	13.96	0.62	0.00	0.62	214.73
06	Bed Opener	1	99.09	5.08	7.26	0.25	0.00	0.25	111.68
06	Blade-Rear 3pt 6'	133	0.55	0.02	0.03	0.19	0.00	0.19	0.79
06	Cultivator Rolling 21'	80	4.18	0.19	0.27	1.20	0.00	1.20	5.84
06	Digger 1-Row 80" #1	375	4.85	0.13	0.19	2.83	0.00	2.83	8.00
06	Digger 1-Row 80" #2	375	4.85	0.13	0.19	2.83	0.00	2.83	8.00
06	Disk 12'	133	5.45	0.21	0.30	1.85	0.00	1.85	7.81
06	Drill-Grain 12'	100	12.71	0.48	0.69	5.30	0.00	5.30	19.18
06	Drip Machine 1 Row - 80"	47	4.85	0.18	0.26	0.42	0.00	0.42	5.71
06	Fertilizer Rig - Broadcast	59	8.89	0.37	0.53	3.67	0.00	3.67	13.46
06	Forklift-Field	647	2.14	0.10	0.14	1.01	6.21	7.22	9.60
06	Forklift-Slab	600	3.25	0.15	0.21	1.54	3.95	5.49	9.10
06	Knife-Sickle 5'	0	51.41	2.64	3.76	0.07	0.00	0.07	57.88
06	Mower - Flail 7'	200	3.57	0.12	0.17	4.57	0.00	4.57	8.43
06	Pickup 1/2 ton	200	11.07	0.44	0.62	2.31	5.75	8.06	20.19
06	Pickup 1/2 ton #2	200	11.07	0.44	0.62	2.31	5.75	8.06	20.19
06	Roller-Flat 8'	10	9.84	0.41	0.59	0.10	0.00	0.10	10.94
06	Roller-Ring 21'	50	5.49	0.28	0.40	0.67	0.00	0.67	6.84
06	Springtooth Harrow 20'	50	4.08	0.21	0.30	0.86	0.00	0.86	5.45
06	Transplanter 4R 2 Bed 13'	147	7.63	0.25	0.36	4.03	0.00	4.03	12.27
06	Triplane 16'	50	16.88	0.81	1.15	2.65	0.00	2.65	21.49
06	Truck 16' bed, 16 bin	200	17.99	0.70	1.01	4.96	7.67	12.63	32.33
06	Truck - Water	200	20.56	0.81	1.15	4.96	4.60	9.56	32.08
06	Vine Cutter 7'	22	3.72	0.19	0.27	0.26	0.00	0.26	4.44
06	Water Wagon 2,500 gal #2	147	4.66	0.20	0.28	0.39	0.00	0.39	5.53
06	Water Wagon 2,500 gal #1	150	4.55	0.19	0.27	0.39	0.00	0.39	5.40
06	Weed Sprayer 100g 13'	100	2.38	0.09	0.13	0.94	0.00	0.94	3.54
06	Weed Spryer w/Shield 20'	61	9.96	0.38	0.54	2.61	0.00	2.61	13.49