# UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

## 2013

## SAMPLE COSTS TO PRODUCE

# BLACKEYE BEANS

***Double Cropped***

## SAN JOAQUIN VALLEY – SOUTH

**Tulare County**


Prepared by:

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**UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION**

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**San Joaquin Valley – South 2013**
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## INTRODUCTION

Sample costs to produce blackeye beans (*Vigna unquiculata)* in the southern 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. Practices described are based on the production practices considered typical for this crop and region, but will not apply to every farm situation. Sample costs for labor, materials, equipment and custom services are based on current figures. A "*Your Costs*" column in Tables 1 and 2 is provided to enter your costs.

The hypothetical farm operations, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of 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 are available for many commodities. Current and archived studies can be downloaded from the department website http://coststudies.ucdavis.edu, requested through Agricultural and Resource Economics at 530-752-6887 or obtained from the local county UC Cooperative Extension offices.

## ASSUMPTIONS

The assumptions refer to Tables 1 to 7 and pertain to sample costs to produce double cropped blackeye beans in the southern San Joaquin Valley, Tulare County. The cultural practices described represent production operations and materials considered typical on a well-managed 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 study does not represent a specific farm and is intended as a guide only. **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.** The hypothetical field and row-crop farm consists of 1,000 non-contiguous acres on which 80 acres are being planted to blackeye beans. Other crops grown on the acres in rotation with blackeye beans include small grains, winter forage, alfalfa hay, cotton, and field corn. Roads, equipment yard, irrigation system and farmstead are on 20 acres.

### Production Cultural Practices and Material Inputs

**Land Preparation**. The ground is disced two times with a stubble disc, then disced two times with an offset or finishing disc to pulverize the surface and incorporate the preplant herbicide. Beds are listed and shaped.

**Planting.** In mid-June following winter forage harvest, the CB46 variety is planted on 30-inch beds into moisture with a 10-row planter at 32 pounds (.32 cwt) of seed per acre. The purchased seed is treated with fungicides to protect against seedling diseases. This double crop planting, is for a "single flush" of beans needing about 90 to 100 days from planting to cutting.

**Fertilization**. Rhizobium, a nitrogen fixing bacteria, is added to the seed at planting. No other fertilizer is applied and is seldom required.

**Irrigation**. The field is furrow irrigated. An irrigation is made in early June prior to planting (preirrigation). The next irrigation is made two to four weeks after planting. In this study the first irrigation is in mid to late July followed by irrigations at approximately 10-day intervals beginning late July and continuing until the last irrigation in September. The grower can use either or both well and surface water. Well water is used at cost of $6.25 per acre-inch or $75 per acre-foot. Effective rainfall is not taken into account; therefore a total of 30-acre inches per year, including the preirrigation, are applied to the field. To facilitate cultural operations, drainage ditches at the end of the field are opened and closed as necessary.

**Pest Management.** The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Dry Beans.* 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.** Adjuvants are recommended for use with many pesticides for effective control, but adjuvants, their costs and their availability are not included in this study. Pesticide costs may vary by location, brand, and grower volume. Pesticide costs in this study are taken from a single dealer and shown as full retail.

*Pest Control Adviser (PCA).* Written recommendations are required for many commercially applied pesticides and are written by licensed pest control advisers. In addition the PCA will monitor the field for agronomic problems including pests, diseases, and nutritional status. Growers may hire private PCAs or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. Costs for a private PCA are not included in this study.

*Weeds.* Prior to planting as a part of land preparation, Prowl H2O is applied with a boom attached to the front of a finish disc. The field is then disced lightly a second time to complete the Prowl incorporation. The field is cultivated with a 10-row cultivator before and after the first irrigation, one time in late June and one time in July.

*Insects.* Lygus bugs (*Lygus hesperus*) are the main insect pest in blackeyes. The lygus bugs can cause reduced yields, affect maturity and seed quality. To control lygus, Warrior is sprayed by air (helicopter) in late July at early bloom, and in August with Dimethoate. In some years, spider mites may need to be treated in some fields, but is not shown as a cost in this study.

*Diseases.* Seeds are treated at the warehouse with fungicides to protect against seedling diseases and the treatment is included in the seed cost. Fusarium wilt (*Fusarium oxysporum*) is a major disease of blackeyes and is controlled by planting resistant varieties.

**Harvest**. The crop is custom cut in early October and custom threshed (harvested) 18 days later. The beans are cut below ground with bean knives attached to the belly of the tractor and then windrowed. Eight rows are cut in one pass. After one to three weeks of drying, when the plants are dry and the beans are around 12% moisture, the beans are threshed with a bean harvester, dumped into bulk trucks and delivered to the warehouse. Custom harvest costs are charged on field weight and/or per acre. Cutting and windrowing costs $60 per acre. Threshing costs $25 per acre plus $3 per hundredweight (cwt). Hauling costs are estimated at $0.65 per hundredweight.

*Yield*. Field weight includes trash, dirt, stones, immature and broken beans. The field weight is this study is 27-hundredweight. After cleaning, assuming an 8% clean out, the net yield is 25-hundredweight (rounded) of U.S. No. 1 beans.

*Warehouse*. The warehouse charges $4.75 per hundredweight field weight to clean the beans, $1.00 per hundredweight to fumigate, and $0.04 per hundredweight to grade. Lot sizes vary, but are considered to be a set of doubles or 6 bobtails. A set of doubles is calculated to be 500 hundredweight and the grading cost in this study was converted to cost per hundredweight. After cleaning, charges are based on clean weight. Insurance cost $0.40 per hundredweight, storage for up to one year cost $0.75 per hundredweight, and bagging is paid by the buyer, but most purchases are bulk.

*Returns*. Based on current markets for U.S. No. 1 grade blackeyes, an estimated price of $50 per hundredweight clean seed is used to calculate returns. Table 4 shows a range of yields over a range of returns for No. 1 beans. Visual quality is important in blackeye marketing, and sales are based on USDA grades. See *United States Standards for Beans*, a publication of the U.S. Department of Agriculture, Federal Grain Inspection Service.

*Assessments/Fees***.** The California Dry Bean Advisory Board (CDBAB) assesses growers $0.19 per clean hundredweight and the warehouses $0.01. The Blackeye Council assesses $0.07 per clean hundredweight. The CDBAB and Council assessments provide funds for marketing and research.

## Labor, Equipment and Interest

**Labor.** Hourly wages for workers are $13.00 for machine operators and $10.00 per hour non-machine labor. Adding 40% for the employer's share of federal and state payroll taxes, insurance, and other possible benefits gives the labor rates shown of $18.20 and $14.00 per hour for machine labor and non-machine labor, respectively. 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, 2012 (personal email from California Department of Insurance, unreferenced). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

**Equipment Operating Costs.** Repair costs for all equipment are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural and Biological 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 red dye diesel and gasoline are $3.84 (excludes excise taxes) and $4.07 per gallon, respectively. The cost includes a 2% local sales tax on diesel fuel, but does not include excise taxes. Gasoline costs include a 7.5% sales tax plus federal and state excise tax. Some federal and excise tax can be refunded for on-farm use when filing your income tax. The costs are based on Department of Energy (DOE) 2012 monthly data. The fuel, lube, and repair cost per acre for each operation in Table 1 is 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 4.75% 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 interest rate is the basic rate provided by a farm lending agency as of January 2013.

**Risk**. The risks associated with crop production 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 profitability and economic viability. Growers may purchase Federal crop insurance for some crops to reduce the production risk associated with specific natural hazards.

## Cash Overhead

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm, not to a particular operation. The field in this study is double cropped; therefore, approximately one-half of the overhead costs are allocated to the other crop.

**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 0.817% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $1,346 for the entire farm or $1.37 per producing acre.

**Office Expense**. Office and business expenses for 1,000 acres are estimated at $60 per producing acre. These expenses include office supplies, telephones, computers, internet access, accounting, legal fees, road maintenance, and miscellaneous cash overhead expenses. Costs are estimated and not based on any specific data.

**Investment Repairs**. Annual repairs on investments or capital recovery items that require maintenance are calculated as two percent of the purchase price

## Non-Cash Overhead

Non-Cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Because the field is double cropped, approximately one-half of the Capital Recovery costs are allocated to the other crop.

**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 prices 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 ((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 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 the 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 Table 5.

*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 and equipment life.

*Interest Rate*. The interest rate of 4.75% used to calculate capital recovery cost is the effective long term interest rate effective January 2013. The interest rate is provided by a local farm lending agency and will vary according to risk and amount of loan.

**Irrigation system**. Water cost varies across the San Joaquin Valley depending on the irrigation district and well characteristics. The farm has three wells and each is 150 deep. Each well has a 75 horsepower electric pump that pumps from a 100-foot depth. The delivery system is an underground cement pipeline with alfalfa valves. A canal also runs through the ranch and is connected to the delivery system by gravity feed. The cost of the irrigation system includes refurbishment of the wells and the value of the delivery system. The cost of $200 per acre is an estimate and not based on any irrigation company data.

**Land.** The price of the land includes an already developed well and irrigation system. Land suitable for bean production will vary widely in value across the region. Prices range from $10,000 to $15,000 per acre (2013 Trends & Leases). The land in this study is owned by the grower and is valued at $12,000 per acre.

**Building**. The metal buildings are on a cement slab and comprise 2,400 square feet.

**Storage Shed**. A small shed used to store pesticides that is posted with warning signs and locked.

**Tools**. This includes shop tools, hand tools, and miscellaneous field tools such as pruning tools.

**Fuel Tanks.** Two 250-gallon fuel tanks using gravity feed are on metal stands. The tanks are setup in a cement containment pad that meets federal, state, and county regulations.

**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 Table 5. 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.

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For information concerning the above mentioned University of California publications contact UC DANR Communications Services at 1-800-994-8849, online at http://danrcs.ucdavis.edu or your local county UC Cooperative Extension office.

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**Table 1. COSTS PER ACRE TO PRODUCE BLACKEYE BEANS (double cropped)**

| Operation | Operation Time (Hrs/A) | Cash and Labor Costs per Acre: Labor Cost | Fuel | Lube & Repairs | Material Cost | Custom/ Rent | Total Cost | Your Cost |
|---|---|---|---|---|---|---|---|---|
| Cultural: | | | | | | | | |
| Stubble Disc 2X | 0.27 | 6 | 11 | 5 | 0 | 0 | 22 | |
| Weed - Preplant (Prowl) | 0.09 | 2 | 2 | 1 | 15 | 0 | 21 | |
| Incorporate Herbicides | 0.08 | 2 | 3 | 1 | 0 | 0 | 6 | |
| List Beds | 0.08 | 2 | 3 | 1 | 0 | 0 | 6 | |
| Make Tail-Ditch | 0.06 | 1 | 2 | 1 | 0 | 0 | 4 | |
| Pre-irrigate | 0.21 | 3 | 0 | 0 | 38 | 0 | 40 | |
| Close Tail-Ditch | 0.06 | 1 | 2 | 1 | 0 | 0 | 4 | |
| Shape Beds | 0.25 | 5 | 10 | 3 | 0 | 0 | 19 | |
| Plant Bean (Seed+Rhizobium) | 0.09 | 2 | 4 | 2 | 34 | 0 | 42 | |
| Cultivate 2X | 0.17 | 4 | 4 | 2 | 0 | 0 | 10 | |
| Irrigate | 1.20 | 17 | 0 | 0 | 150 | 0 | 167 | |
| Insect-Lygus (Warrior) | 0.00 | 0 | 0 | 0 | 20 | 12 | 32 | |
| Insect-Lygus (Dimethoate) | 0.00 | 0 | 0 | 0 | 7 | 12 | 19 | |
| Pickup Truck Use | 1.15 | 25 | 16 | 4 | 0 | 0 | 45 | |
| TOTAL Cultural COSTS | 3.71 | 70 | 59 | 21 | 264 | 24 | 437 | |
| Harvest: | | | | | | | | |
| Cut & Windrow Beans | 0.00 | 0 | 0 | 0 | 0 | 60 | 60 | |
| Thresh Beans | 0.00 | 0 | 0 | 0 | 0 | 106 | 106 | |
| Haul Beans To Warehouse | 0.00 | 0 | 0 | 0 | 0 | 18 | 18 | |
| Clean, Fumigate, Grade | 0.00 | 0 | 0 | 0 | 0 | 156 | 156 | |
| Insurance, Storage, | 0.00 | 0 | 0 | 0 | 0 | 25 | 25 | |
| Assessment CDBAB + BE Council | 0.00 | 0 | 0 | 0 | 7 | 0 | 7 | |
| TOTAL Harvest COSTS | 0.00 | 0 | 0 | 0 | 7 | 365 | 371 | |
| Interest on Operating Capital @ 5.75% | | | | | | | 4 | |
| TOTAL OPERATING COSTS/ACRE | 3.72 | 70 | 59 | 21 | 270 | 389 | 813 | |
| *CASH OVERHEAD: | | | | | | | | |
| Liability Insurance | | | | | | | 1 | |
| Office | | | | | | | 30 | |
| Property Taxes | | | | | | | 63 | |
| Property Insurance | | | | | | | 1 | |
| Investment Repairs | | | | | | | 3 | |
| TOTAL CASH OVERHEAD | | | | | | | 98 | |
| TOTAL CASH COSTS/ACRE | | | | | | | 911 | |
| *NON-CASH OVERHEAD: | | Per producing Acre | | Annual Cost Capital | | | | |
| Building (2400sqft) | | 44 | | 3 | | | 3 | |
| Fuel Tanks/Aboveground | | 2 | | 0 | | | 0 | |
| Irrigation System | | 91 | | 6 | | | 6 | |
| Land-1000 acres | | 6,250 | | 297 | | | 297 | |
| Shop Tools | | 8 | | 1 | | | 1 | |
| Storage Bldg (chemicals) | | 4 | | 0 | | | 0 | |
| Equipment | | 241 | | 25 | | | 25 | |
| TOTAL NON-CASH OVERHEAD | | 6,640 | | 333 | | | 333 | |
| TOTAL COSTS/ACRE | | | | | | | 1,244 | |

*Approximately one-half of the costs allocated between the two crops

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**Table 2. COSTS AND RETURNS PER ACRE TO PRODUCE BLACKEYE BEANS (double cropped)**

| | Quantity/ Acre | Unit | Price or Cost/Unit | Value or Cost/Acre | Your Costs |
|---|---|---|---|---|---|
| GROSS RETURNS | | | | | |
| Blackeye #1 | 25.00 | cwt | 50.00 | 1,250 | |
| TOTAL GROSS RETURNS | 25.00 | cwt | | 1,250 | |
| OPERATING COSTS | | | | | |
| **Custom:** | | | | **389** | |
| Air Apply Helicopter 5gal | 2.00 | acre | 12.00 | 24 | |
| Cut & Windrow beans | 1.00 | acre | 60.00 | 60 | |
| Thresh-Basic Charge | 1.00 | acre | 25.00 | 25 | |
| Thresh-Weight Charge | 27.00 | cwt | 3.00 | 81 | |
| Haul Beans | 27.00 | cwt | 0.65 | 18 | |
| Clean Beans | 27.00 | cwt | 4.75 | 128 | |
| Fumigate Beans | 27.00 | cwt | 1.00 | 27 | |
| Grade Beans/lot | 27.00 | cwt | 0.04 | 1 | |
| Insurance | 25.00 | cwt | 0.25 | 6 | |
| Storage | 25.00 | cwt | 0.75 | 19 | |
| **Seed:** | | | | **32** | |
| CB46 Certified Seed | 32.00 | lb | 1.00 | 32 | |
| **Inoculant:** | | | | **2** | |
| Rhizobium Inoculant | 0.32 | pkg | 7.19 | 2 | |
| **Herbicide:** | | | | **15** | |
| Prowl H20 | 2.00 | pint | 7.62 | 15 | |
| **Insecticide:** | | | | **27** | |
| Warrior II (with Zeon) | 3.84 | floz | 5.25 | 20 | |
| Dimethoate 2.67 | 1.50 | pint | 4.52 | 7 | |
| **Water:** | | | | **188** | |
| Water-Pumped | 30.00 | acin | 6.25 | 188 | |
| **Assessment:** | | | | **7** | |
| CA Dry Bean Advisory Board | 25.00 | cwt | 0.19 | 5 | |
| Blackeye Council | 25.00 | cwt | 0.07 | 2 | |
| **Labor:** | | | | **70** | |
| Equipment Operator Labor | 2.77 | hrs | 18.20 | 50 | |
| Non-Machine Labor | 1.41 | hrs | 14.00 | 20 | |
| **Machinery:** | | | | **79** | |
| Fuel-Gas | 3.94 | gal | 4.07 | 16 | |
| Fuel-Diesel | 11.07 | gal | 3.84 | 43 | |
| Lube | | | | 9 | |
| Machinery Repair | | | | 12 | |
| Interest on Operating Capital (5.75%) | | | | 4 | |
| TOTAL OPERATING COSTS/ACRE | | | | 813 | |
| NET RETURNS ABOVE OPERATING COSTS | | | | 437 | |
| *CASH OVERHEAD COSTS | | | | | |
| Liability Insurance | | | | 1 | |
| Office | | | | 30 | |
| Property Taxes | | | | 63 | |
| Property Insurance | | | | 1 | |
| Investment Repairs | | | | 3 | |
| TOTAL CASH OVERHEAD COSTS/ACRE | | | | 98 | |
| TOTAL CASH COSTS/ACRE | | | | 911 | |

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**Table 2. CONTINUED**

| | Quantity/ Acre | Unit | Price or Cost/Unit | Value or Cost/Acre | Your Costs |
|---|---|---|---|---|---|
| *NON-CASH OVERHEAD COSTS (Capital Recovery) | | | | | |
| Building (2400sqft) | | | | 3 | |
| Fuel Tanks/Aboveground | | | | 0 | |
| Irrigation System | | | | 6 | |
| Land-1,000 acres | | | | 297 | |
| Shop Tools | | | | 1 | |
| Storage Bldg (chemicals) | | | | 0 | |
| Equipment | | | | 25 | |
| TOTAL NON-CASH OVERHEAD COSTS | | | | 333 | |
| TOTAL COST/ACRE | | | | 1,244 | |
| NET RETURNS ABOVE TOTAL COST | | | | 6 | |

*Approximately one-half of the costs allocated between the two crops

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**Table 3. MONTHLY CASH COSTS PER ACRE TO PRODUCE BLACKEYE BEANS (double cropped)**

| Beginning 05-13 | JUN | JUL | AUG | SEP | OCT | TOTAL |
|---|---|---|---|---|---|---|
| Ending 10-13 | 13 | 13 | 13 | 13 | 13 | |
| Cultural: | | | | | | |
| Stubble Disc 2X | 22 | | | | | 22 |
| Weed - Preplant (Prowl) | 21 | | | | | 21 |
| Incorporate Herbicides | 6 | | | | | 6 |
| List Beds | 6 | | | | | 6 |
| Make Tail-Ditch | 1 | 1 | 1 | | | 4 |
| Pre-irrigate | 40 | | | | | 40 |
| Close Tail-Ditch | 1 | 1 | | | 1 | 4 |
| Shape Beds | 19 | | | | | 19 |
| Plant Bean (Seed+Rhizobium) | 42 | | | | | 42 |
| Cultivate 2X | 5 | 5 | | | | 10 |
| Irrigate | | 56 | 56 | 56 | | 167 |
| Insect-Lygus (Warrior) | | 32 | | | | 32 |
| Insect-Lygus (Dimethoate) | | | 19 | | | 19 |
| Pickup Truck Use | 9 | 9 | 9 | 9 | 9 | 45 |
| TOTAL Cultural COSTS | 174 | 104 | 85 | 66 | 9 | 437 |
| Harvest: | | | | | | |
| Cut & Windrow Beans | | | | | 60 | 60 |
| Thresh Beans | | | | | 106 | 106 |
| Haul Beans To Warehouse | | | | | 18 | 18 |
| Clean, Fumigate, Grade | | | | | 156 | 156 |
| Insurance, Storage, | | | | | 25 | 25 |
| Assessment CDBAB + BE Council | | | | | 7 | 7 |
| TOTAL Harvest COSTS | 0 | 0 | 0 | 0 | 371 | 371 |
| Interest on Operating Capital (5.75%) | 1 | 1 | 2 | 2 | -2 | 4 |
| TOTAL OPERATING COSTS/ACRE | 175 | 105 | 86 | 68 | 379 | 813 |
| *CASH OVERHEAD | | | | | | |
| Liability Insurance | 1 | | | | | 1 |
| Office | 30 | | | | | 30 |
| Property Taxes | | 32 | | | | 63 |
| Property Insurance | | 0 | | | | 1 |
| Investment Repairs | 1 | 1 | 1 | 1 | 1 | 3 |
| TOTAL CASH OVERHEAD COSTS | 32 | 33 | 1 | 1 | 1 | 98 |
| TOTAL CASH COSTS/ACRE | 206 | 138 | 87 | 68 | 379 | 911 |

*Approximately one-half of the costs allocated between the two crops

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**Table 4. RANGING ANALYSIS**

COSTS PER ACRE AT VARYING YIELD TO PRODUCE BLACKEYE BEANS (double cropped)

| | YIELD (cwt/acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 16.00 | 19.00 | 22.00 | 25.00 | 28.00 | 31.00 | 34.00 |
| OPERATING COSTS/ACRE: | | | | | | | |
| Cultural Cost | 437 | 437 | 437 | 437 | 437 | 437 | 437 |
| Harvest, warehousing, assessments | 259 | 297 | 334 | 371 | 409 | 446 | 483 |
| Interest on Operating Capital @ 5.75% | 5 | 5 | 5 | 5 | 4 | 4 | 4 |
| TOTAL OPERATING COSTS/ACRE | 702 | 739 | 776 | 814 | 851 | 888 | 925 |
| TOTAL OPERATING COSTS/CWT | 44 | 39 | 35 | 33 | 30 | 29 | 27 |
| CASH OVERHEAD COSTS/ACRE | 98 | 98 | 98 | 98 | 98 | 98 | 98 |
| TOTAL CASH COSTS/ACRE | 800 | 837 | 874 | 911 | 949 | 986 | 1,023 |
| TOTAL CASH COSTS/CWT | 50 | 44 | 40 | 36 | 34 | 32 | 30 |
| NON-CASH OVERHEAD COSTS/ACRE | 333 | 333 | 333 | 333 | 333 | 333 | 333 |
| TOTAL COSTS/ACRE | 1,133 | 1,170 | 1,207 | 1,244 | 1,281 | 1,318 | 1,356 |
| TOTAL COSTS/CWT | 71 | 62 | 55 | 50 | 46 | 43 | 40 |

NET RETURNS PER ACRE ABOVE OPERATING COSTS

| PRICE | YIELD (cwt/acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| $/cwt | 16.00 | 19.00 | 22.00 | 25.00 | 28.00 | 31.00 | 34.00 |
| 35.00 | -142 | -74 | -6 | 61 | 129 | 197 | 265 |
| 40.00 | -62 | 21 | 104 | 186 | 269 | 352 | 435 |
| 45.00 | 18 | 116 | 214 | 311 | 409 | 507 | 605 |
| 50.00 | 98 | 211 | 324 | 436 | 549 | 662 | 775 |
| 55.00 | 178 | 306 | 434 | 561 | 689 | 817 | 945 |
| 60.00 | 258 | 401 | 544 | 686 | 829 | 972 | 1,115 |
| 65.00 | 338 | 496 | 654 | 811 | 969 | 1,127 | 1,285 |

NET RETURNS PER ACRE ABOVE CASH COSTS

| PRICE | YIELD (cwt/acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| $/cwt | 16.00 | 19.00 | 22.00 | 25.00 | 28.00 | 31.00 | 34.00 |
| 35.00 | -240 | -172 | -104 | -36 | 31 | 99 | 167 |
| 40.00 | -160 | -77 | 6 | 89 | 171 | 254 | 337 |
| 45.00 | -80 | 18 | 116 | 214 | 311 | 409 | 507 |
| 50.00 | 0 | 113 | 226 | 339 | 451 | 564 | 677 |
| 55.00 | 80 | 208 | 336 | 464 | 591 | 719 | 847 |
| 60.00 | 160 | 303 | 446 | 589 | 731 | 874 | 1,017 |
| 65.00 | 240 | 398 | 556 | 714 | 871 | 1,029 | 1,187 |

NET RETURNS PER ACRE ABOVE TOTAL COSTS

| PRICE | YIELD (cwt/acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| $/cwt | 16.00 | 19.00 | 22.00 | 25.00 | 28.00 | 31.00 | 34.00 |
| 35.00 | -573 | -505 | -437 | -369 | -301 | -233 | -166 |
| 40.00 | -493 | -410 | -327 | -244 | -161 | -78 | 4 |
| 45.00 | -413 | -315 | -217 | -119 | -21 | 77 | 174 |
| 50.00 | -333 | -220 | -107 | 6 | 119 | 232 | 344 |
| 55.00 | -253 | -125 | 3 | 131 | 259 | 387 | 514 |
| 60.00 | -173 | -30 | 113 | 256 | 399 | 542 | 684 |
| 65.00 | -93 | 65 | 223 | 381 | 539 | 697 | 854 |

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

ANNUAL EQUIPMENT COSTS

| Yr | Description | Price | Yrs Life | Salvage Value | Capital Recovery | Cash Overhead Insur-ance | Cash Overhead Taxes | Total |
|---|---|---|---|---|---|---|---|---|
| 13 | 110 hp 2wd Tractor | 107,591 | 12 | 26,899 | 10,254 | 549 | 672 | 11,476 |
| 13 | 170 hp 4wd Tractor | 164,469 | 12 | 41,119 | 15,675 | 840 | 1,028 | 17,542 |
| 13 | Bed Shaper - 6 Row | 13,292 | 15 | 1,276 | 1,199 | 60 | 73 | 1,331 |
| 13 | Disc - Offset 21' | 25,879 | 15 | 2,485 | 2,334 | 116 | 142 | 2,592 |
| 13 | Disc - Stubble 16' | 43,558 | 15 | 4,182 | 3,928 | 195 | 239 | 4,362 |
| 13 | Ditcher - V | 8,631 | 15 | 829 | 778 | 39 | 47 | 864 |
| 13 | Pickup - Used | 10,500 | 5 | 350 | 2,345 | 44 | 54 | 2,443 |
| 13 | Pickup Truck - 1/2 | 30,000 | 5 | 5,600 | 5,863 | 145 | 178 | 6,186 |
| 13 | Rear Blade - 8' | 4,388 | 18 | 292 | 357 | 19 | 23 | 400 |
| 13 | Saddle Tank 300Gal | 3,218 | 10 | 569 | 366 | 15 | 19 | 400 |
| 13 | Spray Boom - 25' | 4,537 | 10 | 802 | 516 | 22 | 27 | 564 |
| 13 | Lister - 10 Row | 11,333 | 15 | 1,088 | 1,022 | 51 | 62 | 1,135 |
| 13 | Planter - Air10Row | 31,250 | 15 | 3,000 | 2,818 | 140 | 171 | 3,130 |
| 13 | Cultivator-10 Row | 6,875 | 15 | 660 | 620 | 31 | 38 | 689 |
| TOTAL | | 465,521 | | 89,151 | 48,076 | 2,266 | 2,773 | 53,115 |
| 60% of new cost* | | 279,313 | | 53,491 | 28,845 | 1,360 | 1,664 | 31,869 |

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

| Description | Price | Yrs Life | Salvage Value | Capital Recovery | Cash Overhead Insur-ance | Cash Overhead Taxes | Cash Overhead Repairs | Total |
|---|---|---|---|---|---|---|---|---|
| INVESTMENT | | | | | | | | |
| Building (2400sqft) | 85,000 | 20 | 0 | 6,677 | 347 | 425 | 1,700 | 9,149 |
| Fuel Tanks/Aboveground | 3,500 | 20 | 0 | 275 | 14 | 18 | 70 | 377 |
| Irrigation System | 175,000 | 25 | 0 | 12,107 | 715 | 875 | 3,500 | 17,197 |
| Land-1000 acres | 12,000,000 | 50 | 12,000,000 | 570,000 | 0 | 120,000 | 0 | 690,000 |
| Shop Tools | 15,000 | 20 | 0 | 1,178 | 61 | 75 | 300 | 1,615 |
| Storage Bldg (chemicals) | 8,000 | 20 | 0 | 628 | 33 | 40 | 60 | 761 |
| TOTAL INVESTMENT | 12,286,500 | | 12,000,000 | 590,866 | 1,170 | 121,433 | 5,630 | 719,099 |

ANNUAL BUSINESS OVERHEAD COSTS

| Description | Units/ Farm | Unit | Price/ Unit | Total Cost |
|---|---|---|---|---|
| Liability Insurance | 980 | acre | 1.37 | 1,343 |
| Office Expense | 980 | acre | 60.00 | 58,800 |

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**Table 6. HOURLY EQUIPMENT COSTS**

| | | | | COSTS PER HOUR | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Cash Overhead | | | Operating | | | |
| Yr | Description | BEANS Hours Used | Total Hours Used | Capital Recovery | Insur-ance | Taxes | Lube & Repairs | Fuel | Total Oper. | Total Costs/Hr. |
| 13 | 110 hp 2wd Tractor | 33 | 996 | 6.18 | 0.33 | 0.41 | 8.62 | 24.51 | 33.14 | 40.05 |
| 13 | 170 hp 4wd Tractor | 68 | 1,326 | 7.09 | 0.38 | 0.47 | 10.01 | 37.89 | 47.89 | 55.83 |
| 13 | Bed Shaper - 6 Row | 20 | 123 | 5.85 | 0.29 | 0.36 | 2.93 | 0.00 | 2.93 | 9.42 |
| 13 | Disc - Offset 21' | 14 | 133 | 10.54 | 0.52 | 0.64 | 4.13 | 0.00 | 4.13 | 15.83 |
| 13 | Disc - Stubble 16' | 22 | 133 | 17.78 | 0.88 | 1.08 | 6.96 | 0.00 | 6.96 | 26.70 |
| 13 | Ditcher - V | 5 | 132 | 3.54 | 0.18 | 0.22 | 2.37 | 0.00 | 2.37 | 6.31 |
| 13 | Pickup - Used | 40 | 500 | 2.81 | 0.05 | 0.07 | 2.46 | 12.21 | 14.67 | 17.60 |
| 13 | Pickup Truck - 1/2 | 52 | 666 | 5.28 | 0.13 | 0.16 | 3.13 | 15.26 | 18.39 | 23.96 |
| 13 | Rear Blade - 8' | 5 | 167 | 1.29 | 0.07 | 0.08 | 0.65 | 0.00 | 0.65 | 2.09 |
| 13 | Saddle Tank 300Gal | 7 | 149 | 1.47 | 0.06 | 0.08 | 0.87 | 0.00 | 0.87 | 2.48 |
| 13 | Spray Boom - 25' | 7 | 149 | 2.07 | 0.09 | 0.11 | 1.23 | 0.00 | 1.23 | 3.50 |
| 13 | Lister - 10 Row | 7 | 133 | 4.61 | 0.23 | 0.28 | 2.31 | 0.00 | 2.31 | 7.43 |
| 13 | Planter - Air10Row | 7 | 80 | 21.14 | 1.05 | 1.28 | 6.44 | 0.00 | 6.44 | 29.91 |
| 13 | Cultivator-10 Row | 13 | 133 | 2.80 | 0.14 | 0.17 | 1.40 | 0.00 | 1.40 | 4.51 |

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**Table 7. OPERATIONS WITH EQUIPMENT and MATERIALS (double cropped)**

| Operation | Operation Month | Tractor | Implement | Labor Type/ Material | Rate/ acre | Unit |
|---|---|---|---|---|---|---|
| Stubble Disc 2X | June | 170 hp 4wd Tractor | Disc - Stubble 16' | Equipment Operator Labor | 0.32 | hour |
| Weed - Preplant (Prowl) | June | 110 hp 2wd Tractor | Saddle Tank 300Gal | Equipment Operator Labor | 0.11 | hour |
| | | | Spray Boom - 25' | Prowl H20 | 2.00 | pint |
| | | | Disc - Offset 21' | | | |
| Incorporate Herbicides | June | 170 hp 4wd Tractor | Disc - Offset 21' | Equipment Operator Labor | 0.10 | hour |
| List Beds | June | 170 hp 4wd Tractor | Lister - 10 Row | Equipment Operator Labor | 0.10 | hour |
| Make Tail-Ditch | June | 110 hp 2wd Tractor | Ditcher - V | Equipment Operator Labor | 0.02 | hour |
| | July | 110 hp 2wd Tractor | Ditcher - V | Equipment Operator Labor | 0.02 | hour |
| | Aug | 110 hp 2wd Tractor | Ditcher - V | Equipment Operator Labor | 0.02 | hour |
| Pre-irrigate | June | | | Non-Machine Labor | 0.21 | hour |
| | | | | Water-Pumped | 6.00 | acin |
| Close Tail-Ditch | June | 110 hp 2wd Tractor | Rear Blade - 8' | Equipment Operator Labor | 0.02 | hour |
| | July | 110 hp 2wd Tractor | Rear Blade - 8' | Equipment Operator Labor | 0.02 | hour |
| | Sept | 110 hp 2wd Tractor | Rear Blade - 8' | Equipment Operator Labor | 0.02 | hour |
| Shape Beds | June | 170 hp 4wd Tractor | Bed Shaper - 6 Row | Equipment Operator Labor | 0.30 | hour |
| Plant Bean (Seed+Rhizobium) | June | 170 hp 4wd Tractor | Planter - Air10Row | Equipment Operator Labor | 0.11 | hour |
| | | | | CB46 Certified Seed | 32.00 | lb |
| | | | | Rhizobium Inoculant | 0.32 | pkg |
| Cultivate 2X | June | 110 hp 2wd Tractor | Cultivator-10 Row | Equipment Operator Labor | 0.10 | hour |
| | July | 110 hp 2wd Tractor | Cultivator-10 Row | Equipment Operator Labor | 0.10 | hour |
| Irrigate | July | | | Non-Machine Labor | 0.20 | hour |
| | | | | Water-Pumped | 4.00 | acin |
| | July | | | Non-Machine Labor | 0.20 | hour |
| | | | | Water-Pumped | 4.00 | acin |
| | Aug | | | Non-Machine Labor | 0.20 | hour |
| | | | | Water-Pumped | 4.00 | acin |
| | Aug | | | Non-Machine Labor | 0.20 | hour |
| | | | | Water-Pumped | 4.00 | acin |
| | Sept | | | Non-Machine Labor | 0.20 | hour |
| | | | | Water-Pumped | 4.00 | acin |
| | Sept | | | Non-Machine Labor | 0.20 | hour |
| | | | | Water-Pumped | 4.00 | acin |
| Insect-Lygus (Warrior) | July | | | Warrior II (with Zeon) | 3.84 | floz |
| | | | | Air Apply Hel 5gal | 1.00 | acre |
| Insect-Lygus (Dimethoate) | Aug | | | Dimethoate 2.67 | 1.50 | pint |
| | | | | Air Apply Hel 5gal | 1.00 | acre |
| Pickup Truck Use | Aug | | Pickup Truck - 1/2 | Equipment Operator Labor | 0.78 | hour |
| | Aug | | Pickup - Used | Equipment Operator Labor | 0.60 | hour |