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

SAMPLE COSTS FOR BABY LIMA BEANS

SACRAMENTO VALLEY AND

SAN JOAQUIN VALLEY – North 2023

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CONTENTS

INTRODUCTION

Sample costs to produce baby lima beans (*Phaseolus lunatus*) in the Sacramento Valley and northern San Joaquin Valley are shown in this study. This study is intended as a guide only. It can be used to help guide production decisions, estimate potential returns, prepare budgets, and evaluate production loans. Sample costs given for labor, materials, equipment, and contract services are based on May 2023 figures. The practices described are based on production practices considered typical for the crop and area but will not apply to every situation. A blank column titled Your Costs is provided in Tables 1 and 2 to enter your estimated costs.

For an explanation of calculations used in the study refer to the section titled Assumptions. For more information contact Paul Long, Department of Agricultural and Resource Economics, University of California, Davis at 530-752-4651, pmlong@ucdavis.edu. To discuss this study with a Cooperative Extension farm Advisor, contact your county Cooperative Extension office (https://ucanr.edu/About/Locations).

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

Costs and Returns Study Program/Acknowledgements. A cost and return study is a compilation of specific agricultural crop data collected from the region where the study is based.

The authors thank the farmer cooperators and the industry representatives who provided information, assistance, and expert advice, including the California Dry Bean Advisory Board and Bean Warehouses and Dealers. The University of California, Division of Agriculture and Natural Resources (UCANR) is an equal opportunity provider.

ASSUMPTIONS

The following assumptions refer to Tables 1 to 7 and pertain to sample costs to produce baby lima beans in the Sacramento Valley and northern San Joaquin Valley. Cultural practices and costs for baby lima beans vary considerably among growers in the region; therefore, many of the costs, practices, and materials in this study will not be applicable to every farm. The practices and inputs used in this cost study serve 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. This report is based on a 1,500-acre non-contiguous farm on which 200 acres of rented land are producing baby lima beans. The remaining acreage is rented and grower owned land that is planted to alfalfa, field corn, sunflowers, tomatoes, wheat, and orchard crops such as almonds. The grower maintains an equipment yard and shop on a portion of the owned land.

Production Cultural Practices and Material Inputs

Land Preparation. Primary tillage, which includes chiseling, discing, land leveling (laser and triplane), listing beds is done from October through November. The land is chiseled in two directions to open the soil profile and break up any hardpan. The field is then disced twice with a finish disc to create an adequate seedbed and leveled in two passes with a triplane. The fields are laser leveled once every ten years to ensure efficient irrigation, and one-tenth of the cost is charged to the current bean crop. The 30-inch beds are listed by the grower. In the late winter, herbicide is applied to the fallow beds. In the spring, the field is pre-irrigated. Then, the beds are harrowed, pre-emergent herbicides are applied, and then harrowed again to incorporate the herbicide prior to planting.

Planting. Several varieties of bush and vine baby lima beans are available for planting. No specific variety is recommended in this study, however a bush type with lygus tolerance is assumed in this study. Refer to the *Lima Bean Production in California* manual (Long et al, 2014) for seed variety characteristics. Baby lima beans are planted from May to early June (May in this study) using a six-row bean planter. The seeds are purchased with a fungicide seed treatment and planted at 85 pounds per acre. Seeds are planted two inches deep into moisture on 30-inch beds. Beans will emerge seven to ten days after planting depending on soil temperature. Planting costs include the seed, tractor, and tractor driver labor.

Irrigation. The beans are furrow irrigated with one pre-irrigation and five regular in-season irrigations from June to August. Seasonal irrigation of 30 inches of water (5 inches per irrigation event), including the pre-plant irrigation, is applied. Ditches are opened for the pre-irrigation and then closed prior to planting. Ditches are opened again after the cultivation and closed prior to harvest. Water is delivered from the ditches to the furrows by siphon pipes. Irrigation includes the water costs and irrigation labor. Water costs will vary across regions but are assumed at $100 per acre foot ($8.33 per acre-inch) for this study. Most growers use a combination of surface water and well water. The cost of the surface water will vary by water district and can be adjusted in the 'your cost' column in tables 1 and 2.

The Sustainable Groundwater Management Act (SGMA) requires groundwater-dependent regions to halt overdraft and bring basins into balanced levels of pumping and recharge among other sustainability goals. Most of the area described by this cost study is classified by SGMA as being in a medium or high priority basin. Implementation of SGMA in medium and high priority basins is expected to affect the value of irrigation water in the future. Visit the following website for current and detailed information about SGMA (https://water.ca.gov/programs/groundwater-management/sgma-groundwater-management).

Fertilization. The nitrogen (N) fertilizer recommendation for baby lima beans ranges from 80 to 120 lb/acre, depending on existing N levels in the soil and irrigation water. This study assumes that the baby lima beans follow a crop like tomatoes, where there is residual nitrogen in the soil, and no starter fertilizer is applied. The remaining N for the season is applied in June. A side dress application of 50 lb of N (as UAN-32) per acre is side dressed once the beans have reached the three to four leaf stage. This is usually done at the same time as mechanical cultivation for weed control and then followed with an irrigation. Also, a foliar N fertilizer is applied with the first insecticide spray(Awaken). Although not included in the study, other fertilizers or soil amendments (e.g. phosphorus, potassium, sulfur, and gypsum) are applied as needed based on soil testing, field history, and yield potential.

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 (www.ipm.ucdavis.edu). Although growers commonly use the pesticides mentioned, many other pesticides are available. Check with your Pest Control Advisor (PCA) and/or the UC IPM website for current recommendations. To purchase pesticides for commercial use, a grower must be a Certified Private Applicator to obtain a Pesticide Identification number. For information and pesticide use permits, contact the local county agricultural commissioner's office. Pesticides with different active ingredients, modes of action, and sites of action should be rotated as needed to combat species shift and resistance. Adjuvants are recommended for use with many pesticides for effective control, but the adjuvants and their costs are not included in this study.

Written recommendations are required for commercially applied pesticides and are written by licensed PCAs. The PCA will monitor the field for problems including pests, diseases, and nutritional status. Growers may hire private consultants or receive this service as part of an

agreement with an agricultural chemical and fertilizer company. Separate costs for a PCA are not included in this study.

Weeds. Both chemical and mechanical weed control are utilized in this study. In February, Roundup Ultra Max is applied to the fallow beds. In May, the field is harrowed to break up soil crusting. Next, pre-emergent herbicides Sonalan, Prowl H2O, and Dual Magnum are tank mixed and applied pre-plant to the listed beds and furrows with a 25-ft boom, then harrowed into the soil. In June, the fields are cultivated for weed control, and UN-32 is side dressed in the same pass. A second cultivation occurs before the canopy closes.

Insects. The major pests of lima beans are spider mites (*Tetranychus* spp.), lygus bugs (*Lygus* spp.), aphids (*Aphis* spp.), and sometimes armyworms (*Spodoptera* spp.). In July (preflower), a miticide and insecticide tank mix (Acramite 4SC, Warrior II) is applied by ground by the grower. In early August, a custom air application of miticide and insecticides (Acramite 4SC, Warrior II, Intrepid 2F, Dimethoate 4E) is applied during bloom to control mites, aphids, armyworms, and lygus. Additional lygus control may be needed until pod maturity.

Diseases. Seedling diseases, including *Rhizoctonia solani* and *Pythium ultimum,* are prevented using seed treatments and good cultural practices, especially irrigation management. The fungicide seed treatments are applied to the seed by the bean warehouse, and the cost is included in the seed price.

Harvest. The beans are cut and threshed by a custom operator in September. At maturity six rows per pass are cut at ground level with a set of tractor-mounted knives. One to two days later, depending on bean moisture, the cut beans are raked into windrows, pulling together six rows. Lima beans are harvested using bean threshers equipped with two or three slow-turning cylinders. Beans are ready for harvest when they reach 12% moisture. Cutting and raking costs $55 per acre. Threshing/harvesting costs are $5.50 per hundredweight (cwt), including hauling. Other post-harvest bean costs (clean, bag, store) include warehouse charges of $6.50 per cwt.

Yields. The crop yield used in this study is 31 cwt per acre of field/dirt weight or 28 cwt per acre of cleaned beans at 12% moisture. A typical cleanout rate for field run beans is 5-10%.

Returns. Based on the 2022 through 2023 Grower and Warehouse/Buyer data, a price of $75 per cwt is used to calculate returns. Prices for baby lima beans during this period ranged from $60.00 to $90.00 per cwt. The prices are used to show a range of returns over a range of yields in Table 4.

Assessments. The California Dry Bean Advisory Board (CDBAB) promotes marketing and research in dry beans and assesses $0.36 per cwt to all bean varieties (general assessment). Additional assessments are made by varietal councils formed for specific research on that variety. The baby lima council assesses $0.13 per cwt.

Pickup/ATV. Costs for a 3/4-ton pickup and ATV are included in the study. The pickup and ATV may be used by the irrigator, field foreman and/or the grower. The pickup travels 9,000 miles per year (1,500 miles for the beans) and the ATV 3,000 miles per year (500 miles for the beans). The miles are not based on any actual data, but the assumptions are used to calculate a vehicle cost for this study.

Labor, Equipment, and Interest

Labor. Hourly wages for workers are $23.00 for machine operators and $20.00 per hour for non-machine labor. Adding 46% overhead gives the labor rates of $33.58 and $29.20 per hour for machine labor and non-machine labor, respectively. The overhead includes the employer's share of federal and California state payroll taxes, workers' compensation insurance for field crops and a percentage for other possible benefits. Workers' compensation insurance costs will vary among growers. The cost is based on the average industry rate as of May 2023. Labor for operations involving machinery are 20% higher than the operation time given in Table 2 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Wages for management are not included as cash costs. Any return above total costs are considered a return to management. However, growers wanting to account for management may wish to add this expense in the Your Costs column. The manager makes all production decisions including cultural practices, pest management recommendations, and labor.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural 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 diesel and gasoline are $4.10 and $3.70 per gallon, respectively. The costs are based on August 2023, Energy Information Administration (EIA), monthly data. The cost includes a 13.0% sales tax on diesel fuel and 2.25% sales tax on gasoline. Included in the cost per gallon is federal and state excise tax, $0.36 on diesel fuel and $0.42 on gasoline, which are refundable for on-farm use when filing for income tax. Federal highway tax and local district sales taxes are not included. 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 8.5% 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 May 2023.

Risk. The risks associated with crop production should not be underestimated. While this study makes every effort to model a production system based on typical, real-world practices, it cannot fully represent financial, agronomic and market risks, which affect profitability and economic viability of agricultural production. Moreover, Table 4 reflects a ranging analysis of returns based on various assumptions which are hypothetical in nature. *It is important to realize that*

actual results may differ from the returns contained in this study. Any returns above total costs are considered returns on risk and investment to management (or owners).

Cash Overhead

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. These costs can include property taxes, interest on operating capital, office expenses, regulatory compliance, liability and property insurance, sanitation services, equipment repairs, and management.

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.

The Williamson Act. California Land Conservation Act has helped preserve agricultural and open space lands since 1965. Local governments and landowners enter into voluntary contracts to restrict enrolled lands to agricultural and open space uses in exchange for property tax reductions. The impact of the Williamson Act (https://www.conservation.ca.gov/dlrp/wa) on property taxes will vary from year to year and property to property.

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

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

Liability insurance. A standard farm liability insurance policy will help cover the expenses for which an employer becomes legally obligated to pay for bodily injury claims on the property and damages to another person's property as a result of a covered accident. Common liability expenses covered under the policy include attorney fees and court costs, medical expenses for people injured on the property, and injury or damage to another's property. In this study, liability insurance costs $1,623 per year for the entire farm.

Crop Insurance. This is available to baby lima bean growers for any unavoidable loss of production, damage or poor quality resulting from adverse weather conditions such as cool wet weather, freeze, frost, hail, heat, rain, wind and damage from birds, drought, earthquakes and fire. Coverage levels are from 50-85% of the approved average yield as established by verifiable production records from the field. A significant number of growers purchase crop insurance in this region. Crop insurance is not mandatory. With a harvest window in September, it may not be necessary to purchase crop insurance, but growers who are harvesting in October may purchase it due to uncertain weather concerns. In this study we assume the grower elects to purchase Catastrophic Risk Protection which costs an administrative fee of $655 per crop per county, or in this study $3.28 per acre. A baby lima

bean insurance program is administered by the Risk Management Agency of the USDA (https://www.rma.usda.gov/en/Fact-Sheets/National-Fact-Sheets/Dry-Beans).

Office Expenses. Office and business expenses are estimated at $75 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, shop and office utilities, and miscellaneous administrative charges. The cost is a general estimate and not based on actual data.

Regulatory Compliance and Administrative Costs. Compliance and administrative costs are estimated to be $25 per acre. This includes expenses like managing paperwork for regulatory compliance of water quality programs, like waste discharge requirements. This would also include farm evaluation and nitrogen management plan reporting and miscellaneous administrative costs that accompany the compliance paperwork. These tasks can be performed by the grower or are contracted to a consultant.

Land Rent. The land rent is assumed as cash rent at $375.00 per acre. The rented land includes developed wells and an irrigation system that is maintained by the landlord.

Investment Repairs. Annual maintenance is calculated as 2% of the purchase price.

Non-Cash Overhead

Non-cash overhead costs, shown on an annual per-acre basis, are 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 ((Purchase Price – Salvage Value) x (Capital Recovery Factor)) + (Salvage Value x Interest Rate).

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements), the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural and Biological Engineers (ASABE) based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASABE, 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 used and the life of the machine.

Interest Rate. An interest rate of 7% is used to calculate capital recovery. The rate will vary depending upon loan amount and other lending agency conditions but is the basic suggested rate by a farm lending agency as of May 2023.

Buildings. The metal building(s) are constructed on a cement slab totaling 2,400 square feet and are used for shop and/or storage.

Tools. This includes shop tools, hand tools, and miscellaneous field tools. The value of the tools is estimated and not taken from specific data.

Siphon Tubes. It is assumed the grower owns 720, 2-inch siphon tubes for use on the ranch.

Fuel Tanks. Two fuel tanks using gravity feed are on metal stands. Both tanks are 300 gallons. The tanks are set up in a cement containment pad that meets federal, state, and county regulations.

Land Values. Beans are planted on rented land; therefore, land values are not shown in this study. Cropland values in the northern San Joaquin Valley and Sacramento Valley range from $15,000 to $30,000 per acre (2022 Trends & Leases).

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.

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TABLE 1. COSTS PER ACRE TO PRODUCE BABY LIMA BEANS

SACRAMENTO AND NORTHERN SAN JOAQUIN VALLEY – 2023

		Cash and Labor Costs per Acre						
Operation	Time (Hrs/Ac)	Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Pre-plant:								
Laser Level	0.00	0.00	0.00	0.00	0.00	20.00	20.00	
Chisel 18"	0.22	8.15	11.38	4.92	0.00	0.00	24.45	
Finish Disc	0.20	7.39	10.32	4.10	0.00	0.00	21.81	
Landplane-2x	0.26	9.67	5.05	3.12	0.00	0.00	17.84	
List 30" Beds	0.31	11.37	15.87	5.41	0.00	0.00	32.65	
Weed Control-Fallow	0.22	4.03	2.10	1.21	12.50	0.00	19.85	
Open Ditch 1x	0.06	2.01	2.81	0.95	0.00	0.00	5.78	
Close Ditch 1x	0.06	2.01	2.81	0.81	0.00	0.00	5.64	
Irrigation-Pre plant	0.00	14.60	0.00	0.00	41.65	0.00	56.25	
TOTAL PRE-PLANT COSTS	1.33	59.23	50.35	20.53	54.15	20.00	204.26	
Cultural:								
Weed Control-App	0.37	5.64	2.95	1.72	70.62	0.00	80.92	
Plant Beans-Starter	0.37	13.64	7.12	6.00	72.25	0.00	99.01	
Cultivate&Side-dress	0.26	5.64	2.95	1.21	32.50	0.00	42.29	
Open Ditch 1x	0.06	2.01	2.81	0.95	0.00	0.00	5.78	
Irrigate 5x	0.00	73.00	0.00	0.00	208.25	0.00	281.25	
Cultivate	0.15	5.54	2.89	0.96	0.00	0.00	9.39	
Close Ditch 1x	0.06	2.01	2.81	0.81	0.00	0.00	5.64	
Insect/Lygus & Mites + Foliar S	0.22	4.03	2.10	1.21	45.67	0.00	53.02	
Pests-Insect/Lygus & Mites	0.00	0.00	0.00	0.00	35.43	0.00	35.43	
Pests-Insect/Lygus & Aphids	0.00	0.00	0.00	0.00	6.78	30.00	36.78	
Pickup	0.19	6.85	3.11	1.20	0.00	0.00	11.16	
ATV	0.19	6.85	0.21	0.14	0.00	0.00	7.20	
TOTAL CULTURAL COSTS	1.87	125.22	26.96	14.20	471.51	30.00	667.88	
Harvest:								
Cut & Rake Beans	0.00	0.00	0.00	0.00	0.00	55.00	55.00	
Thresh Beans Custom	0.00	0.00	0.00	0.00	0.00	170.50	170.50	
Clean, Bag, Store	0.00	0.00	0.00	0.00	0.00	182.00	182.00	
Assessments	0.00	0.00	0.00	0.00	13.72	0.00	13.72	
TOTAL HARVEST COSTS	0.00	0.00	0.00	0.00	13.72	407.50	421.22	
Interest on Operating Capital at 8.5%							23.80	
TOTAL OPERATING COSTS/A	3.19	184.45	77.31	34.73	539.38	457.50	1317.17	

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TABLE 2. COSTS AND RETURNS PER ACRE TO PRODUCE BABY LIMA BEANS

SACRAMENTO AND NORTHERN SAN JOAQUIN VALLEY – 2023

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Baby Lima	28	Cwt	75	2100	
TOTAL GROSS RETURNS				2100	
OPERATING COSTS					
Herbicide				**83.12**	
Roundup Ultra Max	2	Pint	6.25	12.50	
Dual Magnum	1.3	Pint	15	19.50	
Prowl H20	3	Pint	8.39	25.17	
Sonalan	3	Pint	8.65	25.95	
Insecticide				**59.89**	
Acramite	20	floz	0.54	10.80	
Warrior II	1.92	floz	3.58	6.87	
Acramite	20	floz	0.54	10.80	
Warrior II	1.92	floz	3.58	6.87	
Intrepid	8	floz	2.22	17.76	
Dimethoate 4E	1.5	Pint	4.52	6.78	
Custom				**457.50**	
Laser Level	0.1	Acre	200	20.00	
Application Air 20G	1	Acre	30	30.00	
Cutting & Windrowing	1	Acre	55	55.00	
Threshing	31	Cwt	5.5	170.50	
Clean, Bag, Store	28	Cwt	6.5	182.00	
Fertilizer				**60.50**	
UAN-32	50	Gal	0.65	32.50	
Awaken 7-28-24	1	Qt	28	28.00	
Seed				**72.25**	
Seed Baby Lima Treated	85	Lb	0.85	72.25	
Assessment				**13.72**	
CA Dry Bean Board	28	Cwt	0.36	10.08	
Baby Lima Council	28	Cwt	0.13	3.64	
Irrigation				**249.90**	
Water-Well and District	30	AcIn	8.33	249.90	
Labor				**184.45**	
Equipment Operator	2.88	Hr	33.58	96.85	
Irrigation	3	Hr	29.2	87.60	
Non-Machine	0	Hr	29.2	0.00	
Machinery				**112.03**	
Fuel-Diesel	18.05	Gal	4.1	73.99	
Fuel-Gas	0.90	Gal	3.7	3.32	
Lube				11.60	
Machinery Repair				23.13	
Interest on Operating Capital	8.50%			23.80	
TOTAL OPERATING COSTS/ACRE				1317.17	
TOTAL OPERATING COSTS/CWT				47.04	
NET RETURNS ABOVE OPERATING COSTS				782.83	

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TABLE 2. CONTINUED

SACRAMENTO AND NORTHERN SAN JOAQUIN VALLEY – 2023

Cash Overhead Costs	
Land Rent-Baby Lima Beans	375.00
Liability Insurance	1.03
Office Expense	75.00
Property Taxes	0.35
Crop Insurance Catastropic	3.28
Property Insurance	0.03
Investment Repairs	2.13
Regulatory Compliance	25.00
TOTAL CASH OVERHEAD COSTS/ACRE	481.82
TOTAL CASH OVERHEAD COSTS/CWT	17.21
TOTAL CASH COSTS/ACRE	1798.99
TOTAL CASH COSTS/CWT	64.25
NET RETURNS ABOVE CASH COSTS	301.01
Non-Cash Overhead Costs (Annual Capital Recovery)	
Building 2400 sq ft	4.47
Fuel Tanks 2-300 Gal	0.48
Shop Tools	1.04
Siphon Tubes 720-2"	6.51
Equipment	52.94
TOTAL NON-CASH OVERHEAD COSTS/ACRE	65.44
TOTAL NON-CASH OVERHEAD COSTS/CWT	2.337
TOTAL COSTS/ACRE	1864.42
TOTAL NON-CASH COSTS/CWT	66.587
NET RETURNS ABOVE TOTAL COSTS	235.58

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

TABLE 3. MONTHLY CASH COSTS PER ACRE TO PRODUCE BABY LIMA BEANS

SACRAMENTO AND NORTHERN SAN JOAQUIN VALLEY – 2023

Operation	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	Jul	Aug	Sept	Total
Pre-plant:													
Laser Level	20.00												20.00
Chisel 18"	24.45												24.45
Finish Disc	21.81												21.81
Landplane-2x	17.84												17.84
List 30" Beds	32.65												32.65
Weed Control-Fallow					19.85								19.85
Open Ditch 1x								5.78					5.78
Close Ditch 1x								5.64					5.64
Irrigation-Pre plant								56.25					56.25
TOTAL PRE-PLANT COSTS	116.75				19.85			67.66					204.26
Weed Control-App								80.92					80.92
Plant Beans-Starter								99.01					99.01
Cultivate&Side-dress									42.29				42.29
Open Ditch 1x									5.78				5.78
Irrigate 5x									112.50	112.50	56.25		281.25
Cultivate									9.39				9.39
Close Ditch 1x											5.64		5.64
Insect/Lygus & Mites + Foliar Spray										53.02			53.02
Pests-Insect/Lygus & Mites											35.43		35.43
Pests-Insect/Lygus & Aphids											36.78		36.78
Pickup	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	11.16
ATV	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	7.20
TOTAL CULTURAL COSTS	1.53	1.53	1.53	1.53	1.53	1.53	1.53	181.47	171.49	167.05	135.63	1.53	667.88
Cut & Rake Beans												55.00	55.00
Thresh Beans Custom												170.50	170.50
Clean, Bag, Store												182.00	182.00
Assessments												13.72	13.72
TOTAL HARVEST COSTS												421.22	421.22
Interest on Operating Capital at 8.5%	0.81	0.82	0.83	0.84	0.98	0.99	1.00	2.70	3.87	5.01	5.94	-	23.80
TOTAL OPERATING COSTS/ACRE	119.09	2.35	2.36	2.37	22.36	2.52	2.53	251.84	175.37	172.06	141.57	422.75	1,317.17
CASH OVERHEAD													
Land Rent-Baby Lima Beans												375.00	375.00
Liability Insurance												1.03	1.03
Regulatory Compliance												25.00	25.00
Crop Insurance Catastrophic											3.28		3.28
Office Expense	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	75.00
Property Taxes				0.17						0.17			0.35
Property Insurance				0.01						0.01			0.03
Investment Repairs	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	2.13
TOTAL CASH OVERHEAD COSTS/ACRI	6.43	6.43	6.43	6.62	6.43	6.43	6.43	6.43	6.43	6.62	9.70	407.46	481.82
TOTAL CASH COSTS/ACRE	125.51	8.78	8.79	8.99	28.79	8.95	8.96	258.26	181.79	178.68	151.27	830.21	1,798.99

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

TABLE 4. RANGING ANALYSIS

SACRAMENTO AND NORTHERN SAN JOAQUIN VALLEY – 2023

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE BABY LIMA BEANS

	YIELD (Cwt/Acre)						
	22	**24**	**26**	**28**	**30**	**32**	**34**
OPERATING COSTS/ACRE:							
Pre-Plant	204	204	204	204	204	204	204
Cultural	668	668	668	668	668	668	668
Harvest	331	361	391	421	451	481	511
Interest on operating capital	24	24	24	24	24	24	24
TOTAL OPERATING COSTS/ACRE	1,227	1,257	1,287	1,317	1,347	1,377	1,407
TOTAL OPERATING COSTS/CWT	55.77	52.37	49.50	47.04	44.91	43.04	41.40
CASH OVERHEAD COSTS/ACRE	482	482	482	482	482	482	482
TOTAL CASH COSTS/ACRE	1,709	1,739	1,769	1,799	1,829	1,859	1,889
TOTAL CASH COSTS/CWT	77.67	72.45	68.03	64.25	60.97	58.10	55.57
NON-CASH OVERHEAD COSTS/ACRE	65	65	65	65	65	65	65
TOTAL COSTS/ACRE	1,774	1,804	1,834	1,864	1,895	1,925	1,955
TOTAL COSTS/CWT	80.64	75.18	70.55	66.59	63.15	60.14	57.49

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR BABY LIMA BEANS

PRICE	**YIELD (Cwt/Acre)**						
$/Cwt	**22**	**24**	**26**	**28**	**30**	**32**	**34**
60.00	93	183	273	363	453	543	633
65.00	203	303	403	503	603	703	803
70.00	313	423	533	643	753	863	973
75.00	423	543	663	783	903	1,023	1,143
80.00	533	663	793	923	1,053	1,183	1,313
85.00	643	783	923	1,063	1,203	1,343	1,483
90.00	753	903	1,053	1,203	1,353	1,503	1,653

NET RETURNS PER ACRE ABOVE CASH COSTS FOR BABY LIMA BEANS

PRICE	**YIELD (Cwt/Acre)**						
$/Cwt	**22**	**24**	**26**	**28**	**30**	**32**	**34**
60.00	-389	-299	-209	-119	-29	61	151
65.00	-279	-179	-79	21	121	221	321
70.00	-169	-59	51	161	271	381	491
75.00	-59	61	181	301	421	541	661
80.00	51	181	311	441	571	701	831
85.00	161	301	441	581	721	861	1,001
90.00	271	421	571	721	871	1,021	1,171

NET RETURNS PER ACRE ABOVE TOTAL COST BABY LIMA BEANS

PRICE	**YIELD (Cwt/Acre)**						
$/Cwt	**22**	**24**	**26**	**28**	**30**	**32**	**34**
60.00	-454	-364	-274	-184	-95	-5	85
65.00	-344	-244	-144	-44	55	155	255
70.00	-234	-124	-14	96	205	315	425
75.00	-124	-4	116	236	355	475	595
80.00	-14	116	246	376	505	635	765
85.00	96	236	376	516	655	795	935
90.00	206	356	506	656	805	955	1,105

COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

TABLE 5. WHOLE FARM ANNUAL EQUIPMENT, AND BUISNESS OVERHEAD COSTS

SACRAMENTO AND NORTHERN SAN JOAQUIN VALLEY – 2023

ANNUAL EQUIPMENT COSTS

					Cash Overhead		
	Price	Years Life	Salvage Value	Capital Recovery	Insurance	Taxes	Total
215HP Tractor Trac	240,000	10	70,892	31,799	131	1,554	33,485
95 HP Tractor MFWD	82,698	10	24,428	10,957	45	536	11,538
CultivatorRol6R15'	11,500	12	1,593	1,484	6	65	1,555
CultivatorSled6R15	11,000	12	1,524	1,420	5	63	1,488
Subsoiler - 16'	42,000	10	7,427	5,900	21	247	6,168
Disc - Stubble 16'	45,000	12	6,233	5,808	22	256	6,086
Finish Disc 25'	48,000	12	6,648	6,195	23	273	6,492
Triplane - 16'	55,000	12	7,618	7,099	26	313	7,438
Planter-6 Row 15'	50,000	10	8,842	7,024	25	294	7,343
Ditcher V 6'	15,000	12	2,078	1,936	7	85	2,029
Blade Rear 8'	7,500	10	1,326	1,054	4	44	1,102
SaddleTanks 2-200g	15,000	10	2,829	2,095	8	89	2,192
Spray Boom - 25'	20,000	10	3,537	2,810	10	118	2,937
Pickup 3/4 Ton	55,000	10	16,246	7,287	30	356	7,674
ATV 4WD	8,500	10	2,511	1,126	5	55	1,186
Fertilizer Bar- 6 Row	6,000	6	1,730	1,085	3	39	1,127
Bed Lister 6 Row 30"	20,000	15	2,048	2,336	9	110	2,455
Total	732,198		167,510	97,416	379	4,499	102,294
60% of New Cost*	439,319		100,506	58,450	228	2,699	61,376

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

					Cash Overhead			
Investment	Price	Years Life	Salvage Value	Capital Recovery	Insurance	Taxes	Repairs	Total
Building 2400 sq ft	72,000	30	-	6,700	30	360	1,440	8,530
Fuel Tanks 2-300 gal	6,850	20	478	714	3	37	137	891
Shop Tools	15,000	20	1,050	1,563	7	80	300	1,950
Siphon Tubes 720-2"	8,820	10	617	1,303	4	47	176	1,530
Total Investment	102,670		2,145	10,280	44	524	2,053	12,901

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/Farm	Units	Price/Unit	Total
Land Rent-Baby Lima Beans	200	Acre	375	75,000
Liability Insurance	1,500	Acre	1	1,623
Regulatory Compliance	200	Acre	25	5,000
Crop Insurance Catastrophic	200	Acre	3	655
Office Expense	200	Acre	75	15,000

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

TABLE 6. HOURLY EQUIPMENT COSTS

SACRAMENTO AND NORTHERN SAN JOAQUIN VALLEY – 2023

			HOURLY EQUIPMENT COSTS						
				Cash Overhead		Operating			
	Total Hours Used	Baby Lima Beans Hours Used	Capital Recovery	Insurance	Taxes	Lube and Repairs	Fuel	Total Operating	Total Costs/Hr
215HP Tractor Trac	1600	259	11.92	0.05	0.58	13.67	51.16	64.82	77.38
95 HP Tractor MFWD	1200	233	5.48	0.02	0.27	4.42	19.13	23.54	29.31
CultivatorRol6R15'	166	90	5.36	0.02	0.24	2.20	-	2.20	7.83
CultivatorSled6R15	166	28	5.13	0.02	0.23	2.11	-	2.11	7.49
Subsoiler - 16'	200	40	17.70	0.06	0.74	9.30	-	9.30	27.80
Disc - Stubble 16'	166	0	20.99	0.08	0.93	6.88	-	6.88	28.88
Finish Disc 25'	166	37	22.39	0.08	0.99	7.34	-	7.34	30.81
Triplane - 16'	250	48	17.04	0.06	0.75	8.16	-	8.16	26.01
Planter-6 Row 15'	150	68	28.10	0.10	1.18	12.88	-	12.88	42.25
Ditcher V 6'	166	20	7.00	0.03	0.31	3.91	-	3.91	11.24
Blade Rear 8'	200	20	3.16	0.01	0.13	1.18	-	1.18	4.48
SaddleTanks 2-200g	800	60	1.57	0.01	0.07	2.02	-	2.02	3.66
Spray Boom - 25'	150	60	11.24	0.04	0.47	5.26	-	5.26	17.01
Pickup 3/4 Ton	200	37	21.86	0.09	1.07	6.39	16.65	23.04	46.06
ATV 4WD	200	37	3.38	0.01	0.17	0.77	1.11	1.88	5.44
Fertilizer Bar- 6 Row	200	20	3.25	0.01	0.12	2.32	-	2.32	5.70
Bed Lister 6 Row 30"	400	56	3.50	0.01	0.17	4.16	-	4.16	7.85

UC COOPERATIVE EXTENSION-AGRICULTURAL AND RESOURCE ECONOMICS, UC DAVIS

TABLE 7. OPERATIONS WITH EQUIPMENT & MATERIALS

SACRAMENTO AND NORTHERN SAN JOAQUIN VALLEY – 2023

Operation	Operation Month	Tractor	Implement	Labor Type	Labor Hours/Acre	Material/Custom	Rate/Acre	Unit
Laser Level	Oct					Laser Level	0.1	Acre
Chisel 18"	Oct	215HP Tractor Trac	Subsoiler - 16'	Equipment Operator Lab	0.44			
Finish Disc	Oct	215HP Tractor Trac	Finish Disc 25'	Equipment Operator Lab	0.26			
Finish Disc	Oct	215HP Tractor Trac	Finish Disc 25'	Equipment Operator Lab	0.20			
Landplane-2x	Oct	95 HP Tractor MFW	Triplane - 16'	Equipment Operator Lab	0.53			
List 30" Beds	Oct	215HP Tractor Trac	Bed Lister 6 Row 3(	Equipment Operator Lab	0.62			
Weed Control-Fallow	Feb	95 HP Tractor MFW	Spray Boom - 25'	Equipment Operator Lab	0.22	Roundup Ultra Max	2	Pint
Weed Control-Fallow	Feb		SaddleTanks 2-200g					
Open Ditch 1x	May	215HP Tractor Trac	Ditcher V 6'	Equipment Operator Lab	0.11			
Close Ditch 1x	May	215HP Tractor Trac	Blade Rear 8'	Equipment Operator Lab	0.11			
Irrigation-Pre plant	May			Irrigation Labor	0.50	Water-Well and Distri	5	AcIn
Weed Control-App	May	95 HP Tractor MFW	CultivatorRol6R15'	Equipment Operator Lab	0.31	Dual Magnum	1.3	Pint
Weed Control-App	May		Spray Boom - 25'			Prowl H20	3	Pint
Weed Control-App	May		SaddleTanks 2-200g			Sonalan	3	Pint
Plant Beans-Starter	May	95 HP Tractor MFW	Planter-6 Row 15'	Equipment Operator Lab	0.75	Seed Baby Lima Treat	85	Lb
Open Ditch 1x	June	215HP Tractor Trac	Ditcher V 6'	Equipment Operator Lab	0.11			
Irrigate 5x	June			Irrigation Labor	0.50	Water-Well and Distri	5	AcIn
Irrigate 5x	June			Irrigation Labor	0.50	Water-Well and Distri	5	AcIn
Irrigate 5x	July			Irrigation Labor	0.50	Water-Well and Distri	5	Acln
Irrigate 5x	July			Irrigation Labor	0.50	Water-Well and Distri	5	AcIn
Irrigate 5x	Aug			Irrigation Labor	0.50	Water-Well and Distri	5	AcIn
Cultivate&Side-dress	June	95 HP Tractor MFW	CultivatorSled6R15	Equipment Operator Lab	0.31	UAN-32	50	Gal
Cultivate&Side-dress	June		Fertilizer Bar- 6 Ro					
Cultivate	June	95 HP Tractor MFW	CultivatorSled6R15	Equipment Operator Lab	0.17			
Close Ditch 1x	Aug	215HP Tractor Trac	Blade Rear 8'	Equipment Operator Lab	0.11			
Insect/Lygus & Mites + Fc	July	95 HP Tractor MFW	SaddleTanks 2-200g		0.12	Awaken 7-28-24	1	Qt
Insect/Lygus & Mites + Fc	July		Spray Boom - 25'			Acramite	20	floz
Insect/Lygus & Mites + Fc	July					Warrior II	1.92	floz
Pests-Insect/Lygus & Mite	Aug					Acramite	20	floz
Pests-Insect/Lygus & Mite	Aug					Warrior II	1.92	floz
Pests-Insect/Lygus & Mite	Aug					Intrepid	8	floz
Pests-Insect/Lygus & Aph	Aug					Dimethoate 4E	1.5	Pint
Pests-Insect/Lygus & Aph	Aug					Application Air 20G	1	Acre
Pickup	All	Pickup 3/4 Ton		Equipment Operator Lab	0.20			
ATV	All	ATV 4WD		Equipment Operator Lab	0.20			
Cut & Rake Beans	Sept					Cutting & Windrowin	1	Acre
Thresh Beans Custom	Sept					Threshing	31	Cwt
Clean, Bag, Store	Sept					Clean, Bag, Store	28	Cwt
Assessments	Sept					CA Dry Bean Board	28	Cwt
Assessments	Sept					Baby Lima Council	28	Cwt