PRODUCTION OF FRESH FRUITS AND VEGETABLES AS IT RELATES TO DIRECT MARKETING

***Robert E. Call*[1]**

Production of horticultural crops is a highly technical interplay of science, art, hard work and salesmanship. The science of production can be learned from many information sources but the art of production comes through experience. Hard work begins with planning during the winter months and continues through planting, cultivation, pest control, harvest and marketing. Production of a crop is only half the battle. The ability to sell the crop at prices that will return a profit requires as much skill and hard work as growing the product. The "glamour" of living on the land fades quite fast as a grower has a mature crop and no home for it. It must be remembered that perishable produce is consumed or spoiled in days to weeks after it is harvested.

Successful farming requires initiative, experience, favorable weather, imagination, management, timing, hard work and sometimes plain luck! Before getting started in large scale production ask yourself the following questions to the right:

It is difficult to define all the personal and financial characteristics of any individual that lead to success. However, if any one attribute were to be identified, it would be management ability. Fruit and vegetable farmers must have the ability to juggle several activities at once. These include planting, cultural care, irrigation, pest control and harvest of several different crops at once while doing so in a timely manner. Managing labor and pleasing customers is another aspect that must be done as well as record keeping of finances and crop production. Growing produce crops requires daily observation of the crop and making decisions in a timely and appropriate manner. The other half of the job is selling your products for a profit so you can plant and produce next year.

Question	Answer
1. Do you grow a vegetable garden and keep it weed free?	A positive response does not guarantee success, but a negative answer indicates you may not be interested in the tiresome but critical aspect of growing vegetables - weed control.
2. Do you grow enough fruit and vegetables to can and freeze or would you rather buy produce in the off-season?	People who spend the additional time to can and freeze may be more self reliant and willing to work the extra hours required to be successful.
3. Do you keep records on personal income, monthly bills and expenses or detailed production records?	Precise and continuous record keeping is critical to success. Today's grower can't wait until tax time to find out if any money was made.
4. Do you have additional family members to work on the farm?	Net profits after labor costs may be small. Perhaps you're better off employing family members rather than hired labor. Evaluate your own situation.
5. Do you have adequate savings or off-farm income to cover cash expenses while growing fruits and vegetables?	Cash flow is critical on the farm as most expenses are incurred during the spring and payment may not be made for several months after harvest.
6. Can you afford a net income loss for the first 3 to 5 years?	Experience is expensive and it may take several years to learn to grow and market successfully.
7. Have you developed a 5 or 10 year long-range plan and goals that are written down?	Have a carefully planned goal. It helps get you through the tough times.
8. Do you consider farming a lifestyle or a business?	It better be both if you expect to be successful.

Production Planning

One of the most commonly asked questions is "What should I grow?" The answer is quite simple, "Grow what you can sell for a profit." Generally marketing will direct production. However, determining what and how much of each crop that should sell is difficult.

Two distinct and inclusive categories of markets are available for the sale of vegetables and fruits. These are: 1) fresh produce markets, which usually provide higher returns per unit but require high and consistent quality. Large markets such as grocery and restaurant chains require large quantities which small growers can not usually satisfy; and 2) processors, who provide a steadier market which is less subject to daily price changes which are caused by over or under production. They can also handle large quantities of product and usually have contracts with growers to harvest at certain time intervals to keep their processing facilities operating over a long period of time.

If you want to sell to chain stores and restaurants, you may need to pool your products with other growers and sell through a shipper/broker. In that case your returns will only be about 15 to 25 percent of what retail prices are.

Most new growers of produce are usually better off trying some type of test marketing of direct marketing on a small scale before committing to a specific strategy. Options include, but not limited to, pick-your-own (PYO), roadside stands farmers markets or mail order marketing. However, there are barriers to market entry. For example if a farmers market does not exist it can be very difficult getting one established. Or if your location is poor perhaps a roadside stand may not have the traffic volume to support it. Risk assessment must be done on any new marketing strategy. (See the article on "Assessing Risks and Finance Requirements" in the Market Analysis and Pricing Section).

New growers are encouraged to visit existing operations and talk to the owners. Also speak with local restaurant and grocery store owners. Generally they would prefer to buy high quality, homegrown products. A potential buyer wants not only to know you have a desire to supply quality products, but that you have the ability to produce a quality product in sufficient quantity. The first few years are critical as you seek to gain a reputation as a reliable producer of quality products.

Established markets may take rather large quantities of produce if demand is high. You plan for this. Some vegetables, such as sweet corn, tomatoes, snap beans and melons are usually pre-picked for sale at PYO operations. The reason is that the general public can not judge crop maturity by appearance or feel. Succession plant is imperative to meet the market demands through the growing season. Other crops that can be sold as pre-pick or PYO products. These include bell and chili peppers, eggplant, carrots, potatoes, beets, turnips, cucumbers, cabbage, broccoli, parsley, pumpkins and various summer and winter squashes. If you have in your marketing area people from different regions of the country or ethnic groups, grow products that they enjoyed in their native areas. For examples people from the southern United States enjoy okra, black-eyed peas, collards, turnip and mustard greens. People from Asia enjoy bok-choy, dikon radish, and various greens. However, these can have limited appeal, so beware of over production for local markets.

Production of fruits can be very rewarding. Tree fruits and nuts like apples, pears, peaches, apricots, cherries, plums, citrus, pistachios, pecans and walnuts require a commitment for 20 to 30 years or longer. Spring frost problems can decrease production or wipe it out for the entire year. However, the trees still will need capital investment and labor to keep them growing for next year's crop. Labor for harvest can be great and pick-your-own marketing will reduce harvest costs,

however, many orchards that have plantings of 20 to 30 acres generally sell only 10 to 20% of their crop to PYO customers. The large majority are sold already picked in bags and boxes to commercial customers. This necessitates a packing line which is a major capital investment. Small fruits like grapes, strawberries, raspberries, blackberries, currents and gooseberries will produce marketable crops in the 3rd or 4th year. Production can last from four to eight years in the case of strawberries and brambles and many, many years for other small fruits. For example some grapes will be productive for 50 to 75 years. Small fruits are labor intensive when it comes to harvest and lend themselves well to pick-your-own operations. These fruit plants are shorter lived than tree fruits and therefore more easily changed over to other crops.

In addition to markets, the decision on what to grow will be determined by how much labor, land, equipment and capital you have available. Many vegetables present potentially high returns but also require high capital investment. Generally, the higher the return on a crop the higher the risk. For example sweet corn is relatively easy to produce and market locally, however, the return will be much less that for bell peppers or broccoli, which are more difficult to grow and sell. Also low labor requiring crops might be preferred unless family members are available to work. Sweet corn requires less labor than crops like tomatoes or cucumbers which are picked throughout the season and lend themselves to PYO operations.

Markets not only influence what and how much you choose to grow, but also how it is grown. For example, a pick-your-own market might dictate that a grower produce pole tomatoes or pole beans that can be over the season rather than bush type varieties which will produce for a short period of time and then be tilled under and replanted. Early producing varieties will capture the early market which is usually more lucrative.

Once the appropriate marketing plan and list of potential crops have been developed, the production potential of these crops in the producer's operation should be determined. Although yields vary greatly by location, "good yield" estimates for tree fruits, nuts, small fruits, and vegetables are given at the end of this article. Producers should consider four areas when evaluating the production potential for fruit and vegetable crops. These are: production resources, cost assessment, risk assessment and operation evaluation.

Production Resources. Important production resources to consider are land, water, labor, capital, management and machinery. There is a great variance in soil types and weather patterns even in a relatively small area and must be considered when selecting fruit or vegetable crops for production. When evaluating land and water resources, producers need to consider soil types, topography, wind control, previous cropping history of the site, irrigation system and length of growing season.

The soil type will influence the crop selection process. Some crops can be grown in a wide variety of soils while others need specific soil types. Topography affects the length of the growing season and air and water drainage, light intensity and field erosion. Wind can severely damage fruit and vegetable crops, especially crop stand and quality. Previous crop production can be critical to the success of a fruit or vegetable enterprise. A previous crop on the same field can influence the type of pests and weed problems that the crop will experience. Also, it is important to know the history of the field regarding what pesticides and herbicides have been used on the site and what if any carryover of chemical residues exists.

In order to produce most fruit and vegetable crops an irrigation system is needed. Producers can use ground or surface water with various irrigation technologies, (flood, furrow, sprinkler,

drip) depending on soil types, topography, labor and available capital. Also, irrigation districts plus local, county and state laws may dictate when, how and where you irrigate.

In some cases the short growing season of many vegetable crops allows producers to double and even triple crop plots of land. Several advantages of multi-cropping are that low prices or crop failure may not result in a total loss for the season. It may be possible to keep labor employed for longer periods, thus increasing the chances of having labor when needed. Some crop rotations may decrease the chance of pest buildup and lessen fertility loss. Low pre-harvest capital requirement crops may be used to provide cash for high preharvest capital requirement crops. The ability to sell more than one product produces more traffic, generates repeat consumers, and allows marketing over a longer season. Some disadvantages of multi-cropping are: more management skill and knowledge about each crop's culture is required; labor and harvest scheduling may become more challenging if planting and harvest overlap for different crops; the days to harvest will decrease or increase as temperatures increase or decrease for the same crop; the number of pest problems may increase; and field and harvesting equipment needs may conflict and require more capital investment for the purchase of more equipment. Many of the before mentioned advantages and disadvantages also exist for normal diversification among fruit and vegetable producers growing crops simultaneously on different pieces of land.

Size of operation and crops produced dictate the amount of labor required. Producers should consider when, how much and what type of labor is needed. The timing of labor requirements depends on the crop and its growth pattern. Some crops are more labor intensive during the growing season, while others require more labor at harvest. Labor can come from various sources - family members, area students, local people, unemployment offices, migrant labor or in the case of PYO farms harvest labor from your customers. No matter what the labor source producers need to check the laws and regulations regarding hired labor.

Since some tasks will be regarded as difficult by laborers and labor might not be available, producers should consider using machine energy instead of human energy if possible and financially feasible. Machinery can increase the investment costs but decrease the operating costs of the operation. Some examples of harvest equipment are bean pickers and sweet corn pickers.

In starting most enterprises capital is an important consideration. The amount of capital required, rate of interest, opportunity costs and availability are all very important areas of consideration. Capital resources of other current enterprises should be considered as well as off-farm income and/or some type of commercial financing. Costs of capital are affected by attitudes of lenders toward new enterprises, the amount of risk involved and interest rates.

Producers should consider crop capital requirements and their own capital constraints carefully when selecting fruit and vegetable crops. Establishment of most fruit and vegetables requires large amounts of capital. For example, fruit trees, small fruits and asparagus require significant start-up capital with little or no income for three to five years. Tomatoes require large amounts of labor if they are staked and tied.

Management is an essential part of fruit and vegetable operations. Producers need to consider their management skills when starting any new enterprise. Evaluations should be made of how much experience they have growing fruits and vegetables and other crops that have similar cultural requirements. Also, they should consider if assistance is available to them when problems arise and if they

are willing to seek that assistance when needed.

Commercial fruit and vegetable production requires different growing practices and skills than home gardening. Most horticultural crops require daily observation by the manager in order to control pests and manage other potential problems. The saying, "If you can see the weeds from your truck in a field it is past time to control them," is true. It is much easier to control small weed seedlings than large mature weed plants. Producers with little experience who are not willing to seek and use outside information resources substantially reduce the likelihood of being successful with fruit and vegetable enterprises.

Producers need to evaluate the machinery they own and determine if is suitable for fruit and vegetable production. Can the machinery currently owned be converted for the new enterprise? How expensive is new or used machinery and is it available? Are custom operators available for hire at affordable rates for special operations? Generally fruit and vegetable operations do not require large tractors and implements for cultivation and other cultural practices.

Cost Assessment. Before a new crop or crop mix is placed into production, producers should estimate as completely as possible all costs associated with such production. Direct costs of operation can be estimated based on in put requirements and costs. Some new crops require the purchase of costly new equipment or irrigation systems and the location of new sources of labor and other inputs. Equipment costs should be amortized. Special costs should be accounted for that are associated with different sources of input. Also, the amount of income normally received for other uses from the acreage allotted to the new crop should be in the cost estimates. For instance, if the fruit/vegetable production site is currently used for wheat production, producers should also consider the amount of net income that could have been generated from wheat.

Producers should consider labor and irrigation requirements and their associated costs very closely. Depending on operation size, labor may be a very significant expense. Some crops will require a great deal more labor at planting and harvest than at other times during the production process.

Comparative cost estimates can be useful to evaluate irrigation systems, labor, equipment and other production inputs. Producers can create different input cost scenarios for their various options and select the most efficient. Cooperative Extension can provide useful information to perform cost analyses using crop budgets. (See the article that follows on Estimating Costs of Production.) This information is available for most vegetable and field crops that grow in your county. Contact your local Cooperative Extension Office to obtain this information.

Risk Assessment. After market and farm management decisions have been made, producers should look at the risk involved with each of the enterprises considered. Risk is said to exist when the outcome of an activity is not certain. From the probabilities or estimated probabilities of potential outcomes for an activity, the level of risk associated with that activity can be estimated. Fruit and vegetable producers should be concerned with the probability of disastrously low or negative returns. A small probability of a loss, sufficient to financially destroy a producer, may be "too big a gamble to take". Each producer should evaluate such "gambles" in light of his/her own financial strength and willingness to take risk. (Refer to the article on "Assessing Risks and Finance Requirements" in the Market Analysis and Pricing Section).

Operation Evaluation. After each year of production, it is important for producers

to evaluate their operation. Record keeping done throughout the production period is very useful in the evaluation process. Records should be financial and operational in nature. Financial records should include start-up expense, capital equipment list, cash flow statements, balance sheets and income statements. Operation records should include day-to-day operations and production practices such as when, where and what varieties were planted, fertilizer inputs, pesticides and herbicides used and rates, date and method of spraying, irrigation times and amounts, harvest dates and labor requirements. Also during the year write down notes of ideas that come or ways to improve production. You will not remember many thoughts you had yesterday if they were not written down. These records help producers locate problems or potential weakness that should be addressed and where inputs should be increased or decreased. Tracking specific products for a week or randomly during the marketing season will provide a snapshot of the value of specific products in your marketing program. The evaluation process also helps growers isolate areas of production and management where they need to learn more. Continuous learning and a sound record keeping system are critical to the success of fruit and vegetable operations.

Special Considerations. Fruit and vegetable production is very different from the extensive type of agronomic crops that are grown on large acreage. One acre of vegetables is equivalent to several acres of agronomic crops in terms of capital inputs and management. For example the management time and capital inputs needed to grow and market one acre of quality sweet corn is roughly equivalent to 50 acres of field corn because of insect pressure and harvest costs. Or the harvest of one acre of zucchini through the growing season is equivalent to 100 acres of cotton or wheat because the acre of summer squash must be harvested several times a week for several months.

Producers' Expectations. Farmers should realize that fruit and vegetable crops are not the salvation they are seeking if they are in financial distress. If producers have extreme debt problems and have overextended their credit, fruit and vegetable crops will not clear their debts away. Fruit and vegetable crops can help increase producers' incomes but only with a very high level of management and a fairly high degree of risk. Some studies by universities and experiment stations show potentially high returns per acre. It should be remembered that such information is based on small, intensively managed plots which at times are smaller in scale than a good sized family garden.

Planning. Producer's should make detailed plans of new enterprises well before planting. Market alternatives should be identified and evaluated; field layout and production resources should be planned. All potential crop options should be evaluated in light of particular objectives and resource limitations (land, labor, capital and management).

Knowledge. Producers should objectively evaluate their own abilities, constraints and knowledge relative to growing fruits and vegetables. If they need management assistance and/or information the availability and accessibility of such sources should be considered. The growers willingness to seek out information and assistance should be evaluated. Many books and magazines are available on topics necessary to produce and market quality products. Seminars, conferences, short courses and grower organizations are great places to gather information. Both from presentations and others who are involved in the same business.

Self education and knowledge can be gained by doing small experimental plantings of promising varieties or potential cultural practices. This will enable the grower to see if they are as good in the field as the normal varieties or cultural practices with out the cost in

terms of time and money of a large planting. Cooperative Extension, Experiment Station, Land Grant University and industry personnel can assist growers with on-farm trials.

Much of this article was adapted from: "Should I Grow Fruits and Vegetable? Identifying and evaluating the Possibilities." by Rennee M. Lloyd et. al. Oklahoma State University Cooperative Extension Facts Sheet No. 180.

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FROM:

Direct Farm Marketing and Tourism Handbook.

Yields of Tree Fruits, Nuts and Small Fruits

Tree Fruit	Good Average Yield/A	Yield/Tree	Sales Unit
Apples, semidwarf	660 bushels	4 bushels	bushel (42 pounds)
Cherries *	30,000 pounds	120-200 pounds	lugs (20 pound)
Peaches, nectarines *	250 bushels	2-3 bushels	1/2 bushel (25 pounds)
Pears	400 bushels	2-3 bushels	bushel (50 pounds)
Plums *	200 bushels	2 bushels	1/2 bushel (pounds)
Citrus	**Good Yield (60 lb. Field Box)**	**Yield/Tree (60 lb. Field Box)**	**Sales Unit**
Grapefruit	1000	10	Field box (60 pounds)
Kumquats	300	1.5	Field box (60 pounds)
Lemons	800	8	Field box (60 pounds)
Limes	500	5	Field box (60 pounds)
Mineolas	340	5	Field box (60 pounds)
Oranges			
AZ. Sweet	650	6.5	Field box (60 pounds)
Blood	650	6.5	Field box (60 pounds)
Navel	250	2.5	Field box (60 pounds)
Valencia	650	6.5	Field box (60 pounds)
Tangerines (Mandarins)	600	6	Field box (60 pounds)
Nuts	**Good Yield/pounds/A**	**Pounds/Tree**	**Sales Unit**
Almonds	1,800 in shell	25	pound
Pecans	2,000 in shell (1,000 kernal)	50 (25)	pound
Pistachios	2,000	17-20	pound
Walnuts	4,000 in shell (1,600 kernal)	100	pound
Small fruit	**Good average yield/Acre**	**High Yields**	**Sales Unit**
Blackberries: Thorned	4,000 pounds	6,000 pounds	gallon (6 pounds) or pound
Thornless	6,000 pounds	9,000 pounds	gallon (6 pounds) or pound
Blueberries (need pH 4.5-5.5)	5,000 pounds	7,000 pounds	pound
Grapes	8,000 pounds	10,000 pounds	bushel (44 pounds) or pounds
Red raspberries	4,000 pounds	6,000 pounds	pints (12 pints=11-15 pounds)
Strawberries	7,000 pounds	10,000 pounds	quart (1.5 pounds) or pound

*(Spring Frost Damage Possible)

YIELDS OF VEGETABLE CROPS

Vegetable	Average [1] Yield in the United Stated *(cwt/acre)*	Good Yield [1] *(cwt/acre)*	Average/100 ft. [2] of row *(pounds)*	Sales Unit [3]
Artichoke	75	100	30	Crate (25 pounds) or each
Asparagus	25	40	30	Crate (32 pounds) or pound
Bean, bush	40	100	120	Bushel (28 pounds)
Bean, pole	55	100	150	Bushel (28 pounds)
Bean, Lima	30	40	25-50 shelled	Bushel (32 pounds)
Beets	140	200	150	Crate, bunched doz. (45 pounds)
Broccoli	85	110	100	Bunch (14-18)) or head (1.5 pounds)
Brussels sprouts	125	160	75	Carton (25 pounds)
Cabbage, market	250	300	150	Carton or bag (50 pounds)
Cantaloupe (muskmelon)	140	200	100 fruit	Crate (40 lbs.)
Carrot, topped	280	350	100	Sacks (50 pounds)
Cauliflower	100	150	100	Head (1 pound) Carton (25 pounds)
Celeriac	-	200	60	Bushel (50 pounds)
Celery	500	700	180 stalks	(Crate 60 pounds)
Chard, Swiss	-	150	75	Bushel (20 pounds)
Corn, market	80	120	10 dozen	Dozen or crate (40-60 pounds)
Cucumbers, market	110	250	120	Bushel (48 pounds)
Eggplant	200	250	100	Bushel (33 pounds)
Endive, escarole	140	180	100	Bushel (25-35 pounds)
Garlic	130	160	40	Cases (5, 10, 30) pound
Horseradish	-	80	20	Bushel (50 pounds)
Lettuce	230	350	50	Carton (20,30,50 pounds)
Melon, Persian	120	150	75 fruit	5 lbs each (carton 30 lbs)
Melon, Honeydew	180	250	125 fruit	5 lbs each (carton 30 lbs)
Okra	-	100	100	Bushel (18 or 30 pounds)
Onion	310	400	100	Bag or bushel (50 pounds)
Pea, climbing	40	60	40	Box (10 pounds) Bushel (28 pounds)
Pea, bush	28	40	20	Box (10 pounds) Bushel (28 pounds)
Pepper, bell	110	200	60	Bushel (25 pounds)
Pepper, chili (dried)	40	60	8	1/2 Bushel (15 pounds) Crates (10 pounds)
Pepper, Pimento	40	60	8	Bushel (30 pounds)
Potato (Irish)	250	350	100	Bags (5, 10, 15, 20, 50 pounds)
Pumpkin	-	400	100	Each (10-20 pounds) 1,000 pound bulk bins
Radish			100 bunches	Bushel (30 pounds) or 4 dozen bunch
Rhubarb	-	50	25	
Rutabaga	-	400	100	Bushel or bag (25 or 50 pounds)
Spinach, market	70	150	40 50	Bushel (20 pounds)
Squash, summer	-	300	150	Lugs (20 or 28 pounds)
Squash, winter	-	400	100	Each (5-20 pounds) 1,000 pound bulk bins
Sweet potato	115	200	100	Bushel (50 pounds)
Tomato, market	170	200	100	Bushel (50 pounds) or carton (10-20 pounds)
Turnip (roots or greens)	-	300	50 100	Bushel (50 pounds)
Watermelon	115	200	40 fruits	Each (15 to 25 pounds) 1,000 pound bulk bin

[1] ***Knott's Handbook for Vegetable Growers***. Oscar A. Lorenz and Donald N. Maynard, 1980. John Wiley and Sons, Inc., New York. pp. 299-300.

[2] ***Growing Your Own Vegetables***. 1977. USDA Agriculture Bulletin 409, p. 109.

[3] ***Net Weights and Processed Yields of Fruits and Vegetables in Common Retail Units***. C.M. Sabota and J.W. Courter, 1986. Horticulture Marketing Fact Sheet #3. University of Illinois Cooperative Extension Service.

[3] The Packer 1993. ***Produce Availability and Merchandising Guide***. Volume 100, No. 53, Overland Park,, Kansas.

ESTIMATING COSTS OF PRODUCTION

by James C. Wade, Lew Daugherty, Russell Tronstad[1]

This article describes some of the basics on how cost estimates are determined for The University of Arizona, Cooperative Extension Field and Vegetable Crop Budgets (Wade, et al.). An example for growing red chiles in the Kansas Settlement area of Cochise county is given. The cost estimates given are illustrative rather than a statistical estimate of growing costs for the Kansas Settlement area. Crop production techniques, operations, and procedures can vary with local conditions and farmer preferences.

Growers, lenders, and other users of this information should recognize the representative nature of these income and cost estimates. Some growers may be more efficient, others less so. Adjustments to yields, prices and input requirements may be needed to refine the estimates of income and costs in an actual situation.

The table descriptions that follow give clarifying definitions and assumptions where such information is needed.

Descriptions of Budget Tables

The Arizona Crop Budgeting System provides five tables to describe the details of each crop production system and the costs of production. These tables are labeled as follows:

Table A.	**Income and Operating Cost Summary**
Table B.	**Allocation of Ownership Costs**
Table C.	**Variable Operating Costs**
Table D.	**Resource Requirement and Cash Flow**
Table E.	**Schedule of Operations**

All five tables are provided for each budgeted crop with the table number designating the budget and the following letter designating the table. These tables are ordered to provide 1) general summaries of cost, 2) detailed categorization of costs and 3) the technical information required to compute the costs. Each table is briefly described in the following paragraphs.

Income and Cost Summary (Table A)

Table A for each budget provides a summary of the estimated income and operating costs incurred in producing the specified crop. The total income estimate is the sum of the contributions toward projected income of all products produced by the cropping system, including any subsidies. The income projection is followed by cost summaries for Labor, Chemical and Custom Application, Farm Machinery and Vehicles, Irrigation, and Other Purchased Inputs and Services. Subtotals are provided for Cash, Land Preparation and Growing Expenses, and Cash Harvest and Post Harvest Expenses. Estimates of Operating Overhead for Pickup use and Operating Interest are listed separately. These costs, including sales taxes where appropriate, are summed to provide an estimate of cash operating expenses. The final entry in the table provides an

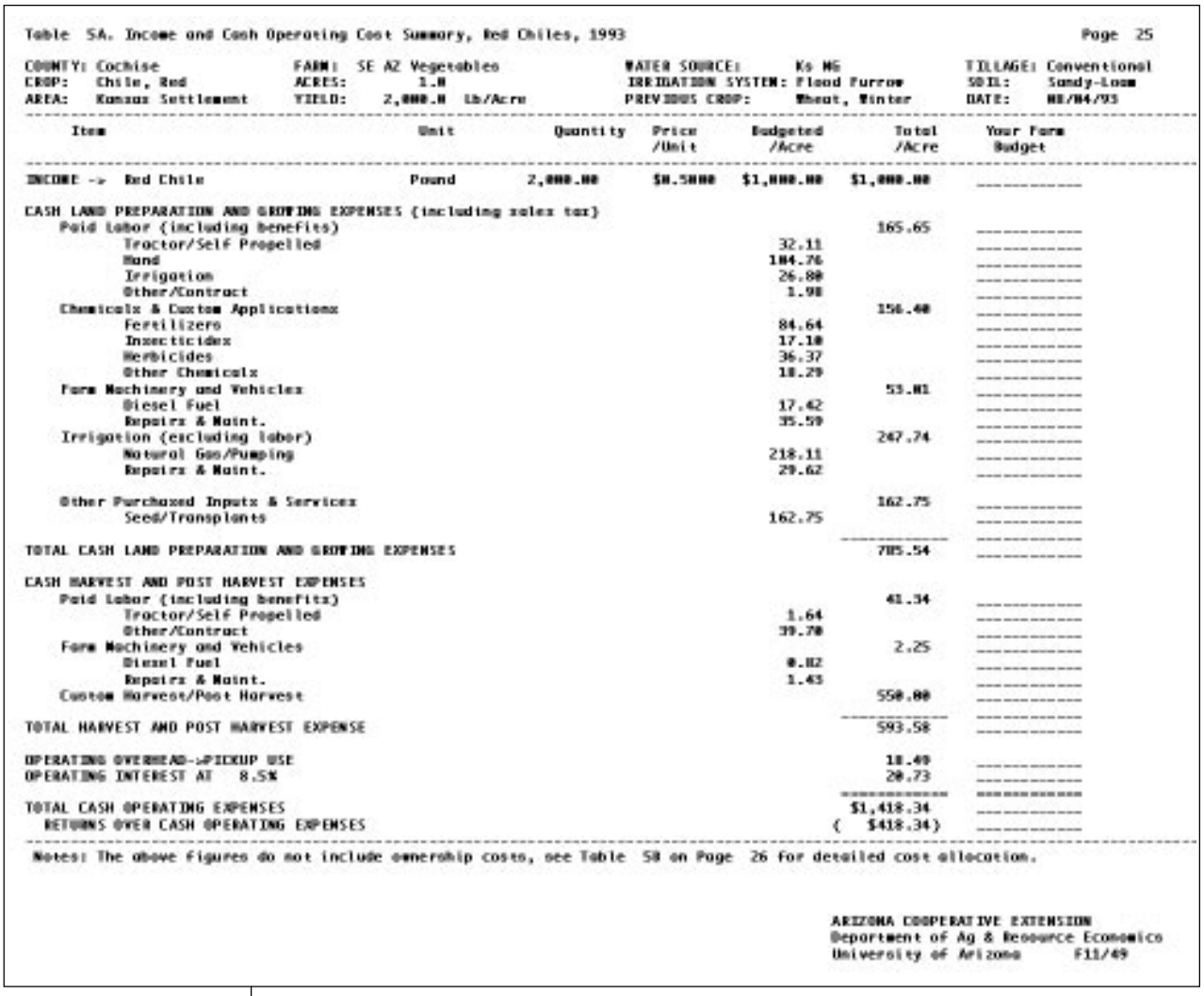

Table 5A. Income and Cash Operating Cost Summary, Red Chiles, 1993 — Page 25

COUNTY: Cochise — FARM: SE AZ Vegetables — WATER SOURCE: Ks MG — TILLAGE: Conventional
CROP: Chile, Red — ACRES: 1.0 — IRRIGATION SYSTEM: Flood Furrow — SOIL: Sandy-Loam
AREA: Kansas Settlement — YIELD: 2,000.0 Lb/Acre — PREVIOUS CROP: Wheat, Winter — DATE: 08/04/93

Item	Unit	Quantity	Price /Unit	Budgeted /Acre	Total /Acre	Your Farm Budget
INCOME -> Red Chile	Pound	2,000.00	$0.5000	$1,000.00	$1,000.00	
CASH LAND PREPARATION AND GROWING EXPENSES (including sales tax)						
Paid Labor (including benefits)					165.65	
Tractor/Self Propelled				32.11		
Hand				104.76		
Irrigation				26.80		
Other/Contract				1.98		
Chemicals & Custom Applications					156.40	
Fertilizers				84.64		
Insecticides				17.10		
Herbicides				36.37		
Other Chemicals				18.29		
Farm Machinery and Vehicles					53.81	
Diesel Fuel				17.42		
Repairs & Maint.				35.59		
Irrigation (excluding labor)					247.74	
Natural Gas/Pumping				218.11		
Repairs & Maint.				29.62		
Other Purchased Inputs & Services					162.75	
Seed/Transplants				162.75		
TOTAL CASH LAND PREPARATION AND GROWING EXPENSES					785.54	
CASH HARVEST AND POST HARVEST EXPENSES						
Paid Labor (including benefits)					41.34	
Tractor/Self Propelled				1.64		
Other/Contract				39.70		
Farm Machinery and Vehicles					2.25	
Diesel Fuel				0.82		
Repairs & Maint.				1.43		
Custom Harvest/Post Harvest					550.00	
TOTAL HARVEST AND POST HARVEST EXPENSE					593.58	
OPERATING OVERHEAD->PICKUP USE					18.49	
OPERATING INTEREST AT 8.5%					20.73	
TOTAL CASH OPERATING EXPENSES					$1,418.34	
RETURNS OVER CASH OPERATING EXPENSES					($418.34)	

Notes: The above figures do not include ownership costs, see Table 5B on Page 26 for detailed cost allocation.

ARIZONA COOPERATIVE EXTENSION
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estimate of the RETURNS OVER CASH OPERATING EXPENSES.

Important Assumptions: Several important assumptions are made in estimating the Operating Costs of Table A.

1). **That all labor costs are paid including allocations for employee benefits.**

2). **Interest on operating loans is assumed paid.**

3). **Yields are estimated using historical averages and trends for the crop and technology considered (5 year averages).**

4). **Crop price estimates are based on commodity trend and outlook information (5 year averages).**

5). **Costs of individual input items are derived from extensive data surveys and are reported in the appendixes of each crop budget.**

The costs of this table are detailed in Table C and described in a following section.

Allocation of Ownership Costs (Table B)

Table B provides a summary of the allocation of ownership costs and the resulting expected returns of the enterprise. The first three lines of this table

Table 5B. Allocation of Ownership Costs: Red Chiles, 1993 Page 26

COUNTY: Cochise FARM: SE AZ Vegetables WATER SOURCE: Ks MG TILLAGE: Conventional
CROP: Chile, Red ACRES: 1.0 IRRIGATION SYSTEM: Flood Furrow SOIL: Sandy-Loam
AREA: Kansas Settlement YIELD: 2,000.0 Lb/Acre PREVIOUS CROP: Wheat, Winter DATE: 08/04/93

Item	-- CASH COST BASIS ($/ACRE) - Income & Costs	Net Returns	- TOTAL COST BASIS ($/ACRE) - Income & Costs	Net Returns
TOTAL INCOME at $ 0.5000/Lb	$1,000.00		$1,000.00	
TOTAL OPERATING EXPENSES	1,418.34		1,418.34	
RETURN OVER CASH OPERATING EXPENSES		($418.34)		($418.34)
CASH OVERHEAD EXPENSES				
Taxes, Housing & Insur., Farm Machinery	4.96		4.96	
Wells & Irrig. System	13.13		13.13	
Gen. & Off. Overhead (5% of Tot. Oper. Exp.)	70.91		70.91	
General Farm Maint. (3% of Tot. Oper. Exp.)	42.55		42.55	
Total Cash Overhead Expenses	131.55		131.55	
Total Cash Oper. & Over. Cost	1,549.89		1,549.89	
RETURNS OVER CASH OPER. & OVER. EXPENSES.		(549.89)		(549.89)
CAPITAL ALLOCATIONS (100% Equity)				
Capital Replacement, Machinery & Vehicles			26.61	
Wells & Irrig. System			53.55	
Interest on Equity, Machinery & Vehicles			15.53	
Wells & Irrig. System			33.51	
Total Capital Allocations			129.20	
RETURNS TO LAND, CAPITAL, MANAGEMENT & RISK		(549.89)		
RETURNS TO LAND, MANAGEMENT & RISK				(679.89)
Land Cost...Rent or Lease	45.00		45.00	
Total Land Costs	45.00		45.00	
RETURNS TO MANAGEMENT, CAPITAL & RISK		(594.89)		
RETURNS TO MANAGEMENT & RISK				(724.89)
Management Services (6% of Tot. Oper. Exp.)			85.10	
TOTAL OWNERSHIP COST	176.55		390.85	
TOTAL COST	$1,594.89		$1,889.20	
RETURN TO MANAGEMENT, CAPITAL & RISK		($594.89)		
RETURN TO RISK (PROFITS)				($889.20)
BREAK-EVEN PRICE TO COVER OPERATING COST (PER Lb)		$0.70		$0.70
BREAK-EVEN PRICE TO COVER OWNERSHIP COST		$0.08		$0.19
BREAK-EVEN PRICE TO COVER TOTAL COST		$0.79		$0.90

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are summaries of the information from Table A.

Two sets of columns provide information on a “Cash Basis” and on a “Total Cost Basis.” The distinction is important. The long term profitability of the enterprise requires <u>that all costs</u> (not just cash costs) be paid.

Cash Basis includes all costs that are paid in cash to laborers, materials vendors, and custom operators, including those costs and interest paid to lending agents. Land rent, land taxes, and irrigation assessments are assumed to be paid in cash if applicable for the budgeted farm.

Total Cost Basis includes (in addition to those cash items described previously) allocations for costs which may or may not be paid in cash, but which are normally <u>not</u> paid in cash. These costs include allocations for capital replacement of farm equipment, opportunity interest on farm equipment and farm land, and non-paid labor and management.

An overview of the table shows that CASH OVERHEAD EXPENSES include estimates for Taxes, Housing, and Insurance on Farm Machinery (including vehicles) and Irrigation Equipment (excluding ditches). General Overhead and General Farm Maintenance are estimated as percentages of the Total Operating Expenses. Estimating procedures for Taxes, Housing, and Insurance are more complex and are documented elsewhere. This group of costs is designated as “cash costs” since they are generally paid in cash during the cropping year.

CAPITAL ALLOCATIONS are designated on a “Total Cost Basis” since they may or may not be paid during the crop-

ping year depending upon the equity/ debt structure of the farm and the capital replacement strategy used. Farmers often replace capital equipment with large "lump sum" purchases. New equipment is then depreciated for tax purposes and replaced when worn out or when personal tax strategy calls for replacement. The funds for such purchases will be borrowed capital, equity capital, or a combination of the two. Interest will be cash interest on borrowed capital and/or opportunity interest on equity capital. Capital replacement is based on an average year utilization of the equipment. Capital replacement estimates and interest costs for Farm Machinery, Vehicles and Irrigation Equipment are shown in Table B (Daugherty and Wade).

Land costs are either cash in the form of Rent, Lease, or Taxes; or non-cash in the form of Opportunity Interest on Equity Investment in Land. Thus, land charges are considered on both "Cash" or "Total Cost Basis." Management Services are estimated on "Total Cost Basis" by taking a percentage of Total Operating Cost as is the common practice of professional farm management farms, since these costs may or may not be paid by the grower depending upon the farm's organization. Most owner- or renter-managed farms will not pay these costs directly.

Table B also provides estimates of net returns at various levels of allocation of ownership costs. The level of net returns depends on whether one examines costs on a "Cash Basis," or a "Total Cost Basis." Returns Over Cash Operating Expenses, Returns Over Cash Operating Expenses and Overhead, Returns to Land, Management and Risk, Returns to Management and Risk, and Returns to Risk (Profits) are all listed in Table B. Each requires a brief explanation.

RETURNS OVER CASH OPERATING EXPENSES are the difference between Total Income and the Cash Operating Expenses. If positive, these returns represent the funds available to pay overhead, ownership expenses, land expenses, and management services plus profits.

RETURNS OVER CASH OPERATING EXPENSES & OVERHEAD are the residual funds available after Cash Operating and Cash Overhead expenses are paid (excluding cash land costs). These funds are available to pay for equipment capital usage, land usage, and management services. These returns are identical to RETURNS TO LAND, CAPITAL, MANAGEMENT & RISK.

RETURNS TO LAND, MANAGEMENT & RISK further reduce the funds available by extracting the costs of equipment capital usage through Capital Allocations. These include the costs of Capital Replacement and opportunity interest on equipment. The grower is assumed to have 100% equity in all equipment. Thus, these costs are considered non-cash and are allocated on a "Total Cost Basis" only. These costs might be partially cash as noted above in the category CAPITAL ALLOCATIONS.

RETURNS TO MANAGEMENT & RISK are the returns remaining after charges for land usage have been extracted. Land clearly represents a dilemma in the allocation of costs since it can be cash in the form of rents or leases, or can be partially cash and partially "economic" cost. For 100% equity ownership of lands, the cash costs are for taxes. However, opportunity interest on land ownership is charged for the "Total Cost Basis."

RETURNS TO RISK (PROFITS) further reduce the net returns for the costs of Management Services. This charge is made on a "Total Cost Basis" only, since many farmers do not directly pay the cost of such management services. Returns to Risk represent the purest level of profits after all resources have been allocated an appropriate portion of the returns.

Table 5C. Variable Operating Costs; Red Chiles, 1993 — Page 27

COUNTY: Cochise — FARM: SE AZ Vegetables — WATER SOURCE: Kx NG — TILLAGE: Conventional
CROP: Chile, Red — ACRES: 1.0 — IRRIGATION SYSTEM: Flood Furrow — SOIL: Sandy-Loam
AREA: Kansas Settlement — YIELD: 2,000.0 lb/Acre — PREVIOUS CROP: Wheat, Winter — DATE: 08/04/93

No.	First Month	Operation	Hours * Machine	Hours * Labor	Operating Costs ($/Acre*) Fuel/Rps.	Labor	Cust/Ser.	Materials	Total	Times	Tot. Cash Expense	Class
1	Jan	Plow	0.321	0.357	6.18	2.83			8.93	1.0	8.93	L
2	Feb	Disk	0.225	0.250	3.45	1.98			5.43	2.0	10.86	L
3	Feb	Laser Level	0.900	2.000	12.09	14.56			26.65	0.3	8.00	L
4	Feb	Landplane	0.225	0.250	3.82	1.98			5.80	0.5	2.90	L
5	Feb	List	0.180	0.200	2.83	1.59			4.42	1.0	4.42	L
6	Mar	Apply Herbicide/Ground	0.150	0.167	2.87	1.33		36.37	39.77	1.0	39.77	G
7	Mar	Suck Rows	0.823	0.825	8.24	0.20			8.44	5.0	2.10	G
8	Mar	Preirrigate		0.424	25.63	2.81			28.44	1.0	28.44	G
9	Mar	Disk Ends	0.822	0.825	8.18	0.20			8.38	4.0	1.53	G
10	Mar	Apply Fert/Ground	0.150	0.167	2.50	1.33		27.81	31.64	1.0	31.64	G
11	Mar	Mulch	0.225	0.250	3.00	1.98			4.98	1.0	4.98	L
12	Apr	Plant	0.225	0.250	3.85	1.98		173.48	179.31	1.0	179.31	L
13	Apr	Irrigate		0.279	17.89	1.85			18.94	12.0	227.28	G
14	May	Cultivate	0.200	0.222	2.38	1.76			4.14	5.0	20.71	G
15	Jun	Thinning		16.667		104.76			104.76	1.0	104.76	G
16	Jun	Apply Fert/Ground	0.225	0.250	4.26	1.98		29.57	35.81	1.0	35.81	G
17	Jun	Apply Fungicide/Air					4.71	6.10	10.81	3.0	32.43	G
18	Aug	Irrigate/Run Fertilizer		0.279	17.89	1.85		27.26	46.20	1.0	46.20	G
19	Aug	Apply Insecticide/Air					4.32	2.04	6.36	1.0	6.36	G
20	Sep	Prepare Ends	0.822	0.825	8.31	0.20			8.51	1.0	8.51	H
21	Oct	Pick 2000.0 lb					500.00		500.00	1.0	500.00	H
22	Oct	Load Produce		6.000		39.69			39.69	1.0	39.69	H
23	Oct	Haul, Custom 1.0 Tn					50.00		50.00	1.0	50.00	H
24	Dec	Cut Stalks	0.164	0.182	1.94	1.44			3.38	1.0	3.38	P
25	Dec	Disk Residue	0.129	0.143	2.14	1.14			3.28	1.0	3.28	L
		Pickup Use 80 Mi/Ac	2.678		18.49						18.49	O
		Operating Interest at 8.50%					20.72				20.72	O
		TOTAL CASH OPERATING EXPENSES:			$321.55	$207.03	$589.18	$314.83			$1,418.34	T

* NOTES: Machine and labor hours and operating cost are for one time over the designated acreage. The "Tot. Cash Expense" column and the "TOTAL CASH OPERATING EXPENSES:" row include all operations, all times over. Classes are defined below.

OPERATING COST SUMMARY BY CLASS

Land Preparation (L)	$222.68
Growing (G)	577.18
Harvest (H)	598.19
Post Harvest (P)	3.37
Marketing (M)	0.00
Operating Overhead (O)	39.21
Total (T)	$1,418.34

SENSITIVITY OF NET REVENUES OVER TOTAL CASH EXPENSES ($/Acre)

Prices ->		-25%	-10%	Budgeted	+10%	+25%	
Yields		$0.37	$0.45	$0.50	$0.55	$0.62	Break-even
-25%	1,500.0	-721.68	-609.18	-534.18	-459.18	-346.68	0.85
-10%	1,800.0	-698.22	-563.22	-473.22	-383.22	-248.22	0.76
Budgeted	2,000.0	-682.57	-532.57	-432.57	-332.57	-182.57	0.71
+10%	2,200.0	-666.93	-501.93	-391.93	-281.93	-116.93	0.67
+25%	2,500.0	-643.47	-455.97	-338.97	-205.97	-18.47	0.63
Break-even Yield		18,727.27	5,476.09	4,128.78	3,313.44	2,556.28	

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Table B concludes with an estimate of the break-even prices of the primary output considering all of the costs previously described and the assumed yield. Break-even prices are those commodity prices below which all resources will not be paid.

Variable Operating Cost (Table C)

Table C provides the detail costs of each operation required to produce the crop. The operations are listed sequentially, with the machine and labor hours required to produce one acre displayed in the first two columns after the operation name. The next five columns give the Machine, Labor, Custom, Materials, and Total Costs for completing the operation one time. The next column gives the number of times the specific operation will be performed. The final cost column gives the Total Expense (Cash) for the total number of times the operation is performed. The final column classifies the operation as either Land Preparation (L), Growing (G), Harvest (H), Post Harvest (P), Marketing (M), or Overhead (O). The total cost for each of these categories is presented at the end of the table. A sensitivity of Net Revenues over Total Cash Expenses examines changes in net returns with changes in price and yield of the produced commodities.

All costs presented in this table are variable operating expenses. No ownership costs are presented. A line entry (if appropriate) following the last operation describes the assumptions for pickup truck usage.

Operating Interest is included as the last line of the table and represents the interest paid on the cash operating expenses excluding pickup truck costs. Total Cash Operating Expenses summarizes the total cost for each category for the total number of times the operations are performed. The specific physical details of operations are presented in Tables E, including assumed job rates, materials, applications rates, equipment requirements, labor requirements, and custom costs.

Table C also includes a summary of cost by Class of Operation; Land Preparation (L), Growing (G), Harvest (H), Post Harvest (P), Marketing (M) and Operating Overhead (O). Finally, Table C includes a sensitivity (break-even) table of net returns over Total Cash Expenses.

Resource and Cash Flow Requirements (Table D)

Resource and Cash Flow Requirements are summarized in Table D by month where the abbreviations P, C, and N represent Previous Year, Current Year, and Next Year, respectively. The Current Year is defined as the calendar year in which harvesting of the output takes place. Summary columns give information on the number of irrigations, water applied, and labor required in each month. Variable (cash) operating expenses are subdivided into Water, Machine, Labor, Chemical, Other Purchases, and Services for each month. The last column gives the Total Cash required to pay variable expenses in each month. These dates all are based on the schedule and calendar of operations described in Table E.

Table 5D. Resource and Cash Flow Requirements: Red Chiles, 1993 — Page 28

COUNTY: Cochise — FARM: SE AZ Vegetables — WATER SOURCE: Ko NG — TILLAGE: Conventional
CROP: Chile, Red — ACRES: 1.0 — IRRIGATION SYSTEM: Flood Furrow — SOIL: Sandy-Loam
AREA: Kansas Settlement — YIELD: 2,000.0 lb/Acre — PREVIOUS CROP: Wheat, Winter — DATE: 08/04/93

Month *	Number Irrig.	Water Applied (Inches)	Total Labor (Hrs)	Operating Cost ($/Acre): Purchased Water	Fuel, Oil & Repairs	Labor	Chemicals	Other Purchases	Services	Total
JAN C			0.85		13.00	6.00				19.01
FEB C			0.92		8.37	6.95				15.31
MAR C	1.0	6.0	0.93		32.11	6.85	64.18			103.14
APR C	1.0	4.0	0.67		22.60	5.02	10.73	162.75		201.10
MAY C	3.0	12.0	1.10		54.07	7.70				61.77
JUN C	3.0	12.0	18.24		60.71	116.20	35.67		4.71	217.29
JUL C	3.0	12.0	1.33		56.45	9.46	6.10		4.71	76.72
AUG C	3.0	12.0	0.83		51.27	5.54	35.40		9.03	101.24
SEP C			0.02		0.31	0.20				0.51
OCT C			3.60			23.82			330.00	353.82
NOV C			2.40			15.88			220.00	235.88
DEC C			0.32		4.00	2.50				6.66
Pickup Use 80 Mi/Ac					10.49					10.49
Operating Interest at 8.5%									20.73	20.73
Total	14.0	58.0	31.26		321.55	206.99	152.00	162.75	589.10	1,410.34
%					22.07	14.59	10.72	11.47	41.53	100.00

TOTAL RESOURCES REQUIREMENTS(/Acre)

Total N	256.1 lbs
Total P	106.0 lbs
Total K	0.0 lbs
Total Labor	31.2 Hrs
Total Water	58.0 AI

TOTAL ENERGY REQUIREMENTS(/Acre)

Diesel Fuel	20.4	Gal
Regular Gas	0.0	Gal
NonLead Gas	0.0	Gal
Natural Gas/Pumping	469.0	Therms
All Direct Energy	50.7	M BTU

EQUIPMENT REQUIREMENTS(/Acre)

Tractor, 125 PTO HP, MFWD	1.46 Hrs	Moldboard Plow, 4-16 2 Way	0.32 Hrs	Offset Disk, 12'	0.45 Hrs
Drag Scraper, 10'	0.27 Hrs	Laser Receiver, Mast System	0.27 Hrs	Laser Trailer	0.27 Hrs
Landplane 12'X 45'	0.11 Hrs	Lister, 7 Bottom	0.10 Hrs	Tractor, 100 PTO HP, MFWD	2.20 Hrs
Rolling Cultivator, 6 Row	1.30 Hrs	Saddle Tk Sprayer, 2 Tk 8 Row	0.15 Hrs	Rowbuck, 10'	0.12 Hrs
Tractor, 40 PTO HP, MFWD	0.09 Hrs	Offset Disk, 16.5'	0.24 Hrs	Fert. Side Dress Unit, 4Row	0.30 Hrs
Power Mulcher, 4 Row	0.23 Hrs	Bed Shaper, 6 Row	0.23 Hrs	Planter, Drill Type, 6 Row	0.23 Hrs
Rotary Stalk Cutter, 4 Row	0.16 Hrs	Pickup Truck, 1/2 Ton	2.67 Hrs		

MATERIALS REQUIREMENTS(/Acre)

Napropamide	4.00 Lb	Water, Pump	58.00 AI	11-53-00, Dry	200.00 Lb
Chile Pepper Sd (OP)	5.00 Lb	Carbofuran	7.00 Lb	46-00-00, Urea 46	250.00 Lb
Copper Hydroxide	6.75 Lb	32-00-00, URAN 32, Lqd	28.00 Gal	BT	0.15 Lb

LABOR REQUIREMENTS(/Acre)

Tractor	4.25 Hrs	Other	2.30 Hrs	Irrigators	4.05 Hrs
Hand Weeders	16.67 Hrs	Produce Loader	2.00 Hrs	Melon Stomper	2.00 Hrs

* NOTE: P = Previous Year C = Current Year N = Next Year

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Additional summary information totals all the requirement columns and provides plant nutrient, water, labor and purchased energy (fuels) summaries.

Finally, detailed lists of all of the equipment, labor and material requirements for the enterprise are provided.

Schedule of Operations (Table E)

The Schedule of Operations (Table E) provides the underlying information for the budgeted costs. The physical requirement and description of each operation are listed in detail, including the first month in which the operation is performed, the number of times the operations are performed, the tractors and implements required, the job rate (acres per labor hour) of each operation, the required materials (quantity, price, and units), the prices and units of required custom (or hired) services, and the labor type used to complete the operation.

Since this table is very important in defining the physical elements of the budgeting process, each column is described in some detail on the following pages.

Table 5E Schedule of Operations; Red Chiles, 1993 Page 29

COUNTY: Cochise FARM: SE #2 Vegetables WATER SOURCE: Ks HG TILLAGE: Conventional
CROP: Chile, Red ACRES: 1.0 IRRIGATION SYSTEM: Flood Furrow SOIL: Sandy-Loam
AREA: Kansas Settlement YIELD: 2,000.0 Lb/Acre PREVIOUS CROP: Wheat, Winter DATE: 08/04/93

No.	First Month	Times	Operation	Equipment/Custom Oper. HP	Equipment/Custom Oper. Self-Prop./Implem.	Job Rate Acres/Hr	Material Use & Cost Name	Material Use & Cost Appl. Rate	Material Use & Cost $/Unit	Service Cost $/Unit	Labor Type
1	Jan	1.0	Plow	125	Moldboard Plow, 4-16 2	2.80					Tractor
2	Feb	2.0	Disk	125	Offset Disk, 12'	4.00					Tractor
3	Feb	0.3	Laser Level	125	Drag Scraper, 10'	1.00					Tractor
					Laser Receiver, Mast Sy						Other
					Laser Trailer						
4	Feb	0.5	Landplane	125	Landplane 12'X 45'	4.00					Tractor
5	Feb	1.0	List	125	Lister, 7 Bottom	5.00					Tractor
6	Mar	1.0	Apply Herbicide/Ground	100	Rolling Cultivator, 6 R	6.00	Napropamide	4.00 Lb	8.66 Lb		Tractor
					Saddle Tk Sprayer, 2 Tk						
7	Mar	5.0	Back Rows	100	Rowbuck, 10'	40.00					Tractor
8	Mar	1.0	Preirrigate			2.36	Water, Pump	6.00 Al	51.25 AF		Irrigator
9	Mar	4.0	Disk Ends	40	Offset Disk, 16.5'	40.00					Tractor
10	Mar	1.0	Apply Fert/Ground	100	Fert. Side Dress Unit,	6.00	11-53-00, Dry	200.00 Lb	264.86 Tn		Tractor
11	Mar	1.0	Mulch	100	Power Mulcher, 4 Ro	4.00					Tractor
12	Apr	1.0	Plant	100	Bed Shaper, 6 Ro	4.00	Chile Pepper Sd (D	5.00 Lb	31.00 Lb		Tractor
					Planter, Drill Type, 6		Carbofuran	7.00 Lb	1.46 Lb		
13	Apr	12.0	Irrigate			3.58	Water, Pump	4.00 Al	51.25 AF		Irrigator
14	May	5.0	Cultivate	100	Rolling Cultivator, 6 R	4.50					Tractor
15	Jun	1.0	Thinning			0.06					Hand Weed
16	Jun	1.0	Apply Fert/Ground	100	Rolling Cultivator, 6 R	4.00	46-00-00, Urea 46	250.00 Lb	225.32 Tn		Tractor
					Fert. Side Dress Unit,						
17	Jun	3.0	Apply Fungicide/Air		CST Air Spray, 7 Gal Mi		Copper hydroxide	2.25 Lb	2.50 Lb	4.71 Ac	
18	Aug	1.0	Irrigate/Run Fertiliz			3.58	Water, Pump	4.00 Al	51.25 AF		Irrigator
							32-00-00, URAM 32,	28.00 Ga	167.67 Tn		
19	Aug	1.0	Apply Insecticide/Air		CST Air Spray, 5 Gal Mi		DT	0.15 Lb	12.98 Lb	4.32 Ac	
20	Sep	1.0	Prepare Ends	100	Offset Disk, 16.5'	40.00					Tractor
21	Oct	1.0	Pick		CST Pick Red Chiles					0.25 Lb	
22	Oct	1.0	Load Produce			0.50					Produce L
											Melon Sta
											Other
23	Oct	1.0	Haul, Custom		CST Haul Red Chiles					50.00 Tn	
24	Dec	1.0	Cut Stalks	100	Rotary Stalk Cutter, 4	5.50					Tractor
25	Dec	1.0	Disk Residue	125	Offset Disk, 16.5'	7.00					Tractor
			Pickup Use 80 Mi/Ac		Pickup Truck, 1/2 Ton	0.38					

* NOTE: Machine times, labor times, and material rates are for one time over the designated acreage.

Column Headings	Description
No.	The sequence number of each operation is provided for the ordering of operations.
First Month	The first month in which each operation is to be performed is displayed for sequencing purposes.
Times	The number of times an operation is performed is identified. An operation name may occur several times in a sequence of budget operations, but if all elements of the operation are identical (e.g., job rate or quantity of materials) then the operations will be combined into a single entry.
Operation	The operation name is identified. Some abbreviations are necessary to fit the limited space available in the table. See Table 1 for a list of these abbreviations.
Equipment/Custom Operation	This general heading identifies either 1) the combination of equipment required to accomplish the operation, or 2) the custom or hired service activity. This entry may be truncated if questions arise about the actual material, refer to the alphabetical entries in Appendixes A and B.
HP	The horsepower rating of the tractor used in this operation is identified. If no tractor is used, this entry is blank.
Self-Prop./Implem.	The implement column identifies 1) the descriptive name of an implement used in the operation, 2) the descriptive name of the self-propelled implement used in the operation, or 3) the descriptive name of a custom activity used in the operation (preceded by the abbreviation CST). Multiple lines may be required for identification of implements towed behind tractors or vehicles.
Job Rate	Job Rate (Acres/ Hr) is defined as the number of acres that can be completed per hour of labor. Machinery hours are usually fewer than labor hours. The budgeting program adjusts all job rates to provide labor and machine hours, as shown in Table C.
Material Use & Cost	Under this broader heading all materials applied during a specific operation are identified using the following information.
Name	The name or names of any fertilizer, chemical, seed, water, or miscellaneous materials used in crop production are listed (one per line). Insofar as possible, the names used are generic, non-trade names. This entry may be truncated if questions about the actual material arise, refer to Appendixes A and B.
Appl. Rate	Each material application rate is identified with the appropriate application unit.
$/Unit	This column specifies the cost of the material with the appropriate units at which the material is purchased.
Service Cost	The cost and purchase unit ($/ unit) of any custom operation identified in the Self-Prop./Implem. column is noted here with the appropriate purchase unit.
Labor Type	The type of labor used in the operation is identified.

The physical descriptions of the cropping operations provide the documentation of the cropping system for which cost estimates are being made.

Summary

Putting together your own cost of production estimates as was illustrated for red chiles is not an easy task. One may be tempted to pencil out just the main cash expenses and revenues. But this approach could lead to disaster if you realize that not all of your costs are being covered after a few years of operation. Taking the time to figure our your break-even price for covering variable costs, all costs, and cash costs is a vital component for pricing decisions and economic viability. If your break-even price (after covering all costs) is higher than the existing competition, then you need to consider growing something else or become innovative at lowering your costs of production. Taking the time to pencil out a detailed crop budget like the one illustrated is the first thing direct marketers should do when starting out and update at the beginning of every year. Unfortunately, a detailed budget often doesn't happen until the money crunch is on and the financial losses are too great to recover from.

References

Daugherty, L., and J.C. Wade, 1993 Arizona Farm Machinery Costs, Extension Bulletin No. 193001, Cooperative Extension, University of Arizona, Tucson, AZ, January 1993.

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FROM:

Direct Farm Marketing and Tourism Handbook.