

**1995 Potato Production Practices for
Southcentral Idaho Potato Growers**

by

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Survey

A survey was mailed to 240 potato growers in the Magic Valley region of Southcentral Idaho in February 1996. A total of 25 usable surveys were returned. The purpose of the survey was to obtain cultural practice information for use in revising the Southcentral Idaho costs and returns estimates (enterprise budgets) for commercial potatoes. While the costs and returns estimates are revised and published on a biennial basis, an in-depth grower survey is conducted only every five or six years.

In general, the survey is not designed to obtain cost information directly from growers. The questions deal primarily with cultural practices used by growers, basically what they do, when they do it and how they do it. The type and quantity of inputs applied is also obtained. The information from individual growers is aggregated and used in developing a representative farm for the region. A microcomputer program from the University of California, Davis, called *Budget Planner* is used to process the data and develop the cost per acre and per hundredweight. Besides specific data on potatoes, the survey also obtains general information about the farm such as the size, rotation, type of irrigation system and water source.

The farming practices, inputs applied and the quantity of inputs specified in this paper are based on grower's response to the survey. They are not University of Idaho recommendations. Because of constantly changing labels and regulations, the University of Idaho can assume no liability for the consequence of using chemicals specified in this report. In all cases, read and follow the directions and precautionary statements on the specific pesticide product label. To simplify information, trade names have been used in most instances. These are the same products listed by growers completing the survey. No endorsement of named products is intended, nor is criticism implied of similar products not mentioned.

It is also important to note that while growers use many of the same inputs and follow similar production practices, each farm is different with a unique set of resources and with different levels of productivity, different production problems, and therefore, different costs.

Rotation

Growers were asked to list all crops in their typical rotation. The length of the crop rotation showed a bimodal distribution which can be characterized as either a "short" or a "long" rotation. The majority of growers (76 percent) follow a short rotation of three to six years with an average of 4.3 years. The remaining growers (24 percent) follow a long rotation of seven to 12 years with an average of 9.7 years. Four years was the most common rotation length and this was used by 44 percent of the growers. Ninety percent the four year rotations included sugarbeets and two years of grain, along with a year of potatoes. The long rotations typically included several years of alfalfa. See Table 1 for detailed rotation information.

Farm Size and Potato Acreage

All farms in the survey were irrigated. Farms ranged in size from 160 acres to 7,500 acres, with an average size of 1,740 acres. The acreage in potatoes ranged from 32 to 2,100 acres, and averaged 419 acres, or 24 percent of the farm's acreage. Russet Burbank accounted for 84 percent of the 1995 potato acreage. Shepody, Ranger and Norkotah accounted for 7 percent, 5 percent and 2 percent, respectively. The remaining two percent was specified as "earlies."

Land Rental Rates

Growers were also asked to provide data on cash and crop share leases on potato ground. The crop share split for tenant/landlord was either 80/20 or 75/25. Cash leases averaged \$310 per acre across all irrigation systems. Generally, the irrigation system was provided by the landlord. On average, land with handlines rented for \$197 per acre with a groundwater source and for \$275 per acre with a surface water source. For land with wheelines, the rent with a groundwater source and surface water source averaged \$240 and \$295, respectively. On land with center pivots, the rent varied little based on water source, averaging \$365 and \$363, respectively, for land with groundwater and land with surface water.

Seed

G-3 seed was planted by 60 percent of Russet Burbank growers and 75 percent of Shepody growers. G-4 was the next most common, accounting for 25 percent of both Russet Burbank and Shepody. Thirteen percent of Russet Burbank seed planted was G-2. Insufficient information was available on other varieties.

Growers were also asked where they obtained their seed potatoes. Fifty six percent of the growers bought seed directly from the seed grower, 26 percent bought from a broker and 18 percent bought from a processor. For the 1995 potato crop, the average price paid for Russet Burbank whole seed was \$6.69 per cwt while the average for cut and treated seed was \$8.07 per cwt. For Shepody, the average price for whole seed was \$12.17 per cwt and cut and treated seed was \$13.28. The price on whole seed for Ranger was \$11 per cwt and for cut and treated seed it was \$13.70.

Russet Burbank growers planted an average of 21 cwt of seed per acre, ranging from a low of 18 to a high of 23.5 cwt. Seed spacing averaged 11 inches, ranging from 8 to 13 inches. Seed size averaged 2.5 oz and ranged from 1.5 to 2.75 ounces. Ninety two percent of Russet Burbank growers reported using a 36 inch row spacing. The remaining eight percent used a 34 inch spacing.

Shepody growers planted an average of 23 cwt of seed per acre, ranging from a low of 22 to a high of 25 cwt. Seed spacing for Shepody averaged 10 inches and ranged from 9.5 to 11 inches. Seed size averaged 2.6 ounces, ranging from 2.2 to 2.75 ounces. Fifty percent of Shepody growers used a 34 inch row spacing and the other fifty percent used a 36 inch row spacing.

Yield

Growers were asked to report both a field-run and a paid yield for 1994 and 1995. Responses on varieties other than Russet Burbank and Shepody were too few to include. On Russet Burbank for 1994 growers reported an average field run yield of 424 cwt per acre and a paid yield of 381 cwt per acre, or 90 percent of field run. For 1995 field run yield on Russet Burbank averaged 389 cwt and paid yield averaged 350 cwt, or 90 percent of field run.

On Shepody for 1994 growers reported an average field run yield of 339 cwt and a paid yield of 298 cwt, or 88 percent of field run. For 1995 field run yield on Shepody averaged 371 cwt and paid yield averaged 337 cwt, or 91 percent of field run.

Water Source and Irrigation

The source for irrigation water included both surface, 27 percent, and ground water, 73 percent. Lift on ground water averaged 320 feet and ranged from 120 feet to 520 feet.

Center pivots were the most commonly used irrigation system, irrigating 68 percent of the acreage. Wheelines and handlines were second and third, respectively with 16 percent and 8 percent of the acreage. Solid sets were used on 8 percent of the acreage. No grower reported using a buried drip system or surface irrigation systems on potatoes.

Use of Consultants

Sixty percent of the growers reported using some type of consulting service and paid an average of \$12.98 per acre in consulting fees. Fees paid ranged from \$9.50 to \$16 per acre. The type of service used was also requested. Irrigation scheduling and fertility/soil testing were the most commonly used services. Both were used by 87 percent of growers using a consultant. Forty seven percent reported using a service for taking petiole samples.

Fumigation

The use of fumigation by potato growers in Idaho has been increasing in recent years. A separate series of questions were asked about the growers use and frequency of use of fumigation. Information on fumigation specific to 1995 was asked in the input section of the survey. The responses reported here differ from those reported in the input section since the input section deals with a specific year and the question addressed here was more general.

When asked if they fumigated their potato ground, 56 percent said yes. Not all growers fumigate every potato crop, however. Forty seven percent of growers indicated they fumigate every potato crop, 33 percent indicated that they fumigated every other potato crop and the remaining 20 percent said that it varied. Some growers indicated they only fumigated ground with a history of nematode problems or only their sandy ground. The average cost of fumigation reported by growers was \$169 per acre. Seventy one percent of growers fumigating indicated they used Vapam, 14 percent indicated they used Metam Sodium, seven percent indicated they used Busan and seven percent indicated they used a combination of Busan and Vapam.

Growers were also asked what type of benefits they saw from fumigation. An increase in yield was the dominant response, along with increasing tuber size and percent number ones. A smaller number indicated that potatoes grown in fumigated ground had a higher specific gravity and were less susceptible to hollow heart. Several growers also mentioned that other crops in the rotation received benefits from fumigation. Grain, dry beans and sugarbeets were all mentioned. A reduction in weed pressure on fumigated ground was also indicated.

Harvesting

The survey also obtained information on the number of workers used during harvest in addition to truck drivers and tractor drivers. Typically, these include workers picking rocks and clods on the potato harvester, as well as workers used to remove debris when potatoes are transloaded or placed in grower storage facilities. An average of eight workers were used on the harvest crew, excluding truck drivers and tractor drivers.

Growers were also asked about the number of trucks used per harvester, depending on whether the potatoes were being placed in on-farm storage, transloaded or hauled to a processor. The average number of trucks per harvester was four when potatoes were hauled to on-farm storage (4.1) or transloaded (3.7). The number of trucks increased to five when potatoes were hauled to a processor (5.4). Note: The number in parenthesis is the unrounded average.

Information was also obtained on the hauling capacity of trucks, round trip hauling distance and the number of loads each truck makes in a typical day. The hauling capacity of trucks averaged 314 cwt, with 300 cwt the most common. The average round trip distance traveled to on-farm storage was 10.8 miles with each truck averaging 6 (6.3) trips per day. The round trip distance to a processor or a processor storage was 20.4 miles with each truck averaging 5 (4.6) loads per day. Growers reported that when they were hauling to on-farm storage they could harvest an average of 24.1 acres per day. This dropped by 21 percent to 19.0 acres per day when hauling to a processor. The hours worked per day during harvest was usually between 12 and 13, with a range of 10 to 16 hours.

Input Summary

Table 2 provides a summary of inputs applied by growers responding to this survey and the average quantity applied. Quantities were not reported on all inputs and in some cases growers would merely indicate "label rate." Only data from complete surveys are included. Inputs were placed in one of nine general categories, including: water, fumigants, insecticides/nematicides, herbicides, fungicides, sprout inhibitor, fertilizer, seed and desiccants. When appropriate, these categories were subdivided to indicate when the input was being applied, i.e. pre-plant, at-planting, or post-plant. Specific products being applied and the percentage of growers who use them is also listed. The percentage in bold type is the percent of all growers responding to the survey who use that input. The percentage next to the product is measured as a percent of only those growers using that particular class of inputs. Using fumigation, for example, 36 percent of growers responding to the survey fumigated in 1995. Of that 36 percent, 11 percent used metam-sodium, 78 percent used Vapam and 11 percent did not indicate what product they used. When the percent of growers in the subcategory exceeds 100 percent, this indicates some growers are applying more than one product.

All inputs applied after harvesting the crop preceding potatoes were credited to the potato crop. Grain was the crop preceding potatoes for three fourths of the growers. Corn, dry beans or hay were the other crops that growers reported growing prior to potatoes. A pre-plant water application in the fall preceding potatoes was used by 85 percent of growers. Typically, this was applied prior to tillage on grain stubble and averaged 3.1 inches of water. During the growing season, growers applied an average of 22.2 inches of water. An additional 1.1 inches of water was applied prior to harvest for a total of 26.4 inches. Eighty five percent of growers reported using a pre-harvest irrigation.

Thirty six percent of the growers fumigated prior to growing potatoes in 1995. Eleven percent used Metam Sodium at 40 gallons per acre and 78 percent used Vapam at an average of 47 gallons per acre. The remaining 11 percent did not report the product or quantity used.

Pre- or at-planting applications of insecticides/nematicides were used by 68 percent of the growers. The pre-plant was generally made at spring markout. Thimet was the most widely used product and was used by 82 percent of growers using a pre- or at-plant insecticide/nematicide. Furadan and Mocap were both used by 18 percent of growers using a pre- or at-plant insecticide/nematicide. One grower used more than one product. Thirty six percent of all growers reported using a post plant insecticide. Monitor, Thimet and Thiodan were used by an equal number of growers, 33 percent, and Ambush was used by 11 percent. Three growers used more than one product.

All growers reported using a herbicide for weed control. Only eight percent of growers reported using a pre-plant herbicide, but all growers used at least one product post plant. Sencor (Lexone) was the most commonly used herbicide and was used by 80 percent of all growers. Eptam was the second most widely used herbicide, used by 68 percent of growers when combining pre- and post-plant applications, and Prowl was the third most commonly used herbicide, used by 64 percent of growers.

Post plant fungicides were used by 92 percent of the growers. Bravo was the most commonly used fungicide and was used by 70 percent of growers applying a fungicide. Dithane and Maneb were the second and third most commonly used fungicides. Twelve percent of growers reported using a fungicide at or after vine kill. The late season applications may have been in response to late blight's first appearance in the Magic Valley which occurred in August and September. The Acrobat application was certainly in response to late blight. The majority of fungicides, however, were applied for early blight or other disease problems.

MH30 applied pre-harvest as a sprout inhibitor was used by only 4 percent of growers.

All growers applied fertilizer, but only 18 of the 25 respondents provided a complete record of all fertilizer applications. The average amount of fertilizer applied included: 240 lbs of N, 213 lbs of P₂O₅, 141 lbs of K₂O and 76 lbs of SO₄. A number of different micronutrients were also applied. Often, the grower merely indicated "micros applied," and did not specify the type or amount. Fertilizer applications were classified as fall pre-plant, spring pre-plant, at-plant and post plant. A fall pre-plant fertilizer application was used by 67 percent of growers, while 44 percent of growers used a spring pre-plant. Eleven percent of growers applied fertilizer at planting and 94 percent applied post plant fertilizers. The type of nutrient and the average application are specified in Table 2.

Forty four percent of growers reported using a desiccant to kill vines prior to harvest, with 45 percent of these using sulfuric acid, 36 percent using Diquat and 18 percent using Endquick. The trend in recent years has been back to the use of a mechanical vine kill. See defoliation in Table 3 for the percentage of growers using mechanical, chemical or a combination of the two to kill vines.

Field Operation Summary

Table 3 provides a summary of field operations reported by growers responding to the survey. Field operations were placed in one of the following nine general categories: irrigation, seedbed preparation - fall, seedbed preparation - spring, planting, cultivation, fertilization, pesticide application, defoliation, and harvest. All field operations, including irrigation, following the harvest of the crop preceding potatoes are credited to potatoes. This includes operations to remove, chop or incorporate crop residue as well as fall tillage operations. If an implement is used more than once, for example the field is disked twice, each pass over the field is considered a separate operation. Average implement width is listed along with the horsepower of the tractor used to pull it. The percentage of growers using a particular field operation is listed in bold, with the percentage of growers using a particular implement also given. When the total of the percent of growers using an operation exceeds 100 percent, this indicates growers are using more than one field operation. Row markout was classified as a seedbed preparation operation, rather than a planting operation. This provides a consistent classification whether markout is done in the spring just prior to planting, or whether it is done the previous fall when the field is "bedded."

Fall seedbed preparation was used by 88 percent of growers. An average of 3.4 field operations were performed, not counting irrigation. Fifty six percent of growers who reported fall field operations used some type of chopper/shredder on straw residue prior to incorporation. The most commonly used tillage implements included: rippers, disks and chisel plows. Forty two percent of growers reporting fall field operations marked rows or bedded potato fields in the fall.

Spring seedbed preparation was used by 56 percent of growers. An average of 1.2 field operations were performed prior to planting, including row markout. Row markout in either the fall or spring was used by all growers. Many growers would also apply inputs during this operation.

A 4-row planter was used by 80 percent of growers, a 6-row planter was used by 16 percent and four percent used an 8-row planter. Twenty five percent of the growers using a 4-row planter were using two planters and thirty three percent of growers using a 6-row planter were using two planters.

Mechanical cultivation after planting was reported by 84 percent of growers. Forty eight percent of growers were using a some type of basin tillage tool and 34 percent specifically mentioned using a rolling cultivator.

Fertilizer and pesticide applications were classified as to the time of application. All growers reported applying fertilizer pre-plant, while only 12 percent applied fertilizer at planting. Ninety six percent of growers reported post-plant fertilizer applications. The type of equipment used during fertilizer application is also given, unless it was custom applied. Custom application of preplant fertilizer was most common, 76 percent, while postplant fertilizer applications were made mostly through the irrigation system, 75 percent. Fifty two percent of growers applied

fertilizer during spring row markout or planting. Many growers used more than one method of application when applying pre- and post-plant fertilizer.

Pesticide applications include applications of fumigants, insecticides/nematicides, herbicides and fungicides. The most common method of applying the fumigant was through the irrigation system, a practice followed by 78 percent of growers. Pre- and at-planting insecticides were applied through the planter by 94 percent of growers who applied them, at row markout by 12 percent, and when disking by 6%. The most common method of applying post plant insecticides was aerial application. This method was used by 75 percent of growers. Twenty five percent of growers also applied the insecticide through the irrigation system and/or at cultivation. Application of post plant herbicides were most commonly done through the irrigation system, 44 percent. Custom application, including aerial application, was 24 percent, during cultivation accounted for 28 percent and ground sprayers accounted for 20 percent. Post plant fungicides were most commonly applied by air, 87 percent, with 30 percent applied through the irrigation system.

Defoliation includes both vine rolling and vine killing. Vine rolling was listed separately from vine kill since it serves to seal soil cracks as in addition to killing vines. Sixty four percent of growers reported rolling vines prior to harvest. Eighty percent of growers used some type of vine kill method, including mechanical, chemical or a combination of mechanical and chemical. Forty percent of these growers were using only a mechanical method, forty percent were using only a chemical method and 15 percent reported using both. The remaining five percent only specified vine kill and not the method.

Harvest is the last field operation category. Eighty percent of growers were using two-row harvesters, with 16 percent of these growers using two harvesters. Twenty percent of growers were using 4-row harvesters, with four percent using two 4-row harvesters. Seventy two percent of growers were also using windrowers during harvest, with 40 percent using 2-row and 32 percent using 4-row.

Summary

The information provided in this publication can help those unfamiliar with a modern commercial potato operation gain some understanding. It is also useful to those who are familiar with potato operations as it documents current potato production practices. However, care must be exercised in interpreting the data because modern farming operations are so complex and because obtaining comprehensive data on all aspects of the production process is extremely difficult. Care should also be shown when trying to utilize this data for something other than its original purpose, which was to update cost of production estimates. While the operations and input levels are representative of potato growers in the Magic Valley of Idaho, the data does not have the statistical rigor to imply that these are average for the area. The detail and quality of data provided by the growers responding to the survey was excellent, especially considering the survey's length. The authors would like to thank the growers who completed and returned the survey.

Table 1. Crop Rotations for SCI Russet Burbank Grower Survey

	Rotation	Length of Rotation	
		Short	Long
1	P-W-B-SB	4	
2	P-SB-B-W	4	
3	P-SB-G-CS-G	5	
4	P-B-WW-P-B-WW-H-H-H		9
5	P-WW-H-H-C	5	
6	P-SB-G	3	
7	P-WW-SB-Bly-P-WW-SB-Bly-H-H-H-H		12
8	P-Bly-B-B-H-H-B-B		8
9	P-SB/CS-G	3	
10	P-W-SB-W	4	
11	P-SB-W-Bly-SB-W	6	
12			10
13	P-SB-W-W	4	
14	P-WW-C-C-Bly-P	6	
15	P-SB-Bly-W-W-Bly-A-A-A-A-A-W		12
16	P-W-W-SB	4	
17	P-WW-SB-W	4	
18	P-SB-WW-WW	4	
19	P-SB-W-Bly	4	
20	P-W-C-B	4	
21	P-SB-W-Bly	4	
22	P-WW-SB-Bly	4	
23	P-SB-W-W-SB-W	6	
24	P-WW-A-A-A-A-CS		7
25	P-WW-WW	3	
26			
Average		4.3	9.7

KEY:	H - Hay
A - Alfalfa	P - Potatoes
B - Beans	SB - Sugarbeet
Bly - Barley	W - Wheat
C - Corn	WW - Winter Wheat
CS - Corn Silage	
G - Grain	

Table 2. A Summary of Inputs Applied by Southcentral Idaho Commercial Potato Growers for 1995.

Input Category	Inputs	Quantity Per Acre	Unit	% Usage/No. of Responses	Average No. of Inputs Applied	Average No. of Applications
WATER	Average Pre-Plant Irrigation	3.1	in	100%		
	Average Post Plant Irrigation	22.2	in	85%		
	Average Pre-Harvest Irrigation	1.1	in	100%		
	Average Total Irrigation	26.4	in	85%		
FUMIGANTS				36%		
	Metam-Sodium	40	gal	11%		
	Vapam	47.2	gal	78%		
	Not Specified	?		11%		
INSECTICIDES/ NEMATICIDES	Pre or At Plant			68%	1.2	1.1
	Furadan	3	qt	18%		
	Mocap	30	lbs	12%		
	Mocap L	1	gal	6%		
	Thimet	15.3	lbs	82%		
	Post Plant			36%	1.6	1.6
	Ambush	0.5	pt	11%		
	Monitor	1	qt	33%		
	Thimet	17.3	lbs	33%		
	Thiodan	1	qt	33%		
HERBICIDES				100%		
	Pre-Plant			8%		
	Eptam	3.0	pt	100%		
	Treflan	0.75	qt	50%		
	Post Plant			100%		
	Dual	1.5	qt	8%		
	Eptam	3.6	pt	60%		
	Prowl	1.8	pt	64%		
	Roundup	2.0	pt	4%		
	Sencor (Lexone)	0.75	pt	8%		
Sencor DF (Lexone)	0.63	lbs	72%			
Treflan	0.8	pt	4%			

Table 2. (cont.) A Summary of Inputs Applied by Southcentral Idaho Commercial Potato Growers for 1995.

Input Category	Inputs	Quantity Per Acre	Unit	% Usage/No. of Responses	Average No. of Inputs Applied	Average No. of Applications	
FUNGICIDES	Post Plant			92%	3.3	2.8	
	Acrobat	?		4%			
	Bravo	0.8	pt	70%			
	Copper	1.5	qt	4%			
	Curzate	1.63	lbs	4%			
	Dithane	1.25	qt	30%			
	Kocide	1	pt	4%			
	Maneb	1.25	qt	17%			
	Penncozeb	1.5	lbs	9%			
	Ridomil	?		4%			
	Rovral	2	pt	4%			
	Supanil	1.6	pt	4%			
	Super Tin	0.75	pt	4%			
	Terranil	1.5	pt	4%			
	At or Post Vine Kill			12%			1.0
	Copper	10	lbs	33%			
	Copper Sulfate	?		33%			
		Kocide	?		33%		
	SPROUT INHIBITOR				4%		
		MH30	?		100%		
FERTILIZER				100%			
	Total						
	N	240	lbs	18			
	P ₂ O ₅	213	lbs	18			
	K ₂ O	141	lbs	14			
	SO ₄	76	lbs	11			
	Micros			10			
	Other Fertilizer			6			

Table 2. (cont.) A Summary of Inputs Applied by Southcentral Idaho Commercial Potato Growers for 1995.

Input Category	Inputs	Quantity Per Acre	Unit	% Usage/No. of Responses	Average No. of Inputs Applied	Average No. of Applications
FERTILIZER	Fall Pre-Plant			67%	4.6	1.5
	N	104	lbs	100%		
	P ₂ O ₅	191	lbs	92%		
	K ₂ O	155	lbs	67%		
	SO ₄	57	lbs	25%		
	Micros			25%		
	Other Fertilizer			25%		
	Spring Pre-Plant			44%	4.6	1.3
	N	116	lbs	100%		
	P ₂ O ₅	156	lbs	88%		
	K ₂ O	86	lbs	75%		
	SO ₄	61	lbs	75%		
	Micros			25%		
	Other Fertilizer			13%		
	At Plant			11%	2.5	1.0
	N	14	lbs	100%		
	P ₂ O ₅	30	lbs	100%		
	K ₂ O	5	lbs	50%		
	SO ₄	0	lbs	0%		
	Micros			0%		
Other Fertilizer			0%			
Post Plant			94%	4.6	3.0	
N	133	lbs	94%			
P ₂ O ₅	74	lbs	47%			
K ₂ O	42	lbs	29%			
SO ₄	61	lbs	29%			
Micros			35%			
Other Fertilizer			6%			
SEED				100%		
	G-2 Burbank Seed	20	cwt	8%		
	G-3 Burbank Seed	21	cwt	68%		
	G-4 Burbank Seed	21	cwt	24%		
DESICCANTS				44%		
	Diquat	1	qt	36%		
	Endquick	20.25	gal	18%		
	Sulfuric Acid	21.25	gal	45%		

Table 3. A Summary of Southcentral Idaho Commercial Potato Growers' Field Operations for 1995.

Input Category	Implement	Average No. of Rows	Average Width	Average Tractor HP	% Usage/No. of Responses	Average No. of Operations
IRRIGATION	Handline				100%	
	Wheelline				8%	
	Center Pivot				16%	
	Solid Set				68%	
SEEDBED PREPARATION - FALL	Baler			195	5%	3.4
	Beater		16	200	5%	
	Bedder	8	24	170	9%	
	Chisel Plow		15	180	27%	
	Deep Coil Shank		20	320	5%	
	Disk		22	240	27%	
	Disk/Ripper		14	225	5%	
	Flail Shredder		30	150	5%	
	Harrow		30	100	5%	
	Hydraset Plow		6	175	5%	
	Marker	4	12	195	5%	
	Marker	6	18	200	5%	
	Marker	8	24	175	9%	
	Marker	?	?	?	5%	
	Moldboard Plow		14	80	5%	
	Offset Disk		15	160	50%	
	Ripper		16	250	59%	
	Ripper/Marker	6	18	200	9%	
	Shredder		15	140	5%	
	Straw Chopper		15	145	36%	
Tandem Disk		27	320	18%		
SEEDBED PREPARATION - SPRING	Chisel Plow		14	180	14%	1.2
	Coil Shank		24	320	7%	
	Disk		14	155	14%	
	Marker	4	12	160	36%	
	Marker	6	18	175	14%	
	Marker	8	24	185	43%	
	Marker	12	36	275	7%	
	Moldboard Plow		12	175	7%	
	Plow		?	160	7%	
	Ripper		14	170	14%	
Ripper/Harrow		16	200	14%		

Table 3. (cont.) A Summary of Southcentral Idaho Commercial Potato Growers' Field Operations for 1995.

Input Category	Implement	Average No. of Rows	Average Width	Average Tractor HP	% Usage/No. of Responses	Average No. of Operations
PLANTING	Planter	4	12	150	100% 64%	1.2
	2 Planters	4	12	180	16%	
	Planter	6	18	180	12%	
	2 Planters	6	18	200	4%	
	Planter	8	24	200	4%	
CULTIVATION	Bedder	4	12	200	84% 5%	
	Cultivator	4	12	145	10%	
	Cultivator	8	24	140	5%	
	Cultivator/Shanks	4	12	155	5%	
	Dammer Diker	4	12	150	24%	
	Dammer Diker	6	18	190	14%	
	Dammer Diker	8	24	195	5%	
	Dammer Diker/Cultivator	8	24	250	5%	
	Hiller	?	?	?	5%	
	Ripper/Diker	4	12	150	5%	
	Rolling Cultivator	4	12	130	29%	
	Rolling Cultivator	8	24	195	5%	
	9 Shank	8	24	105	5%	
	Shovels	4	12	180	5%	
	(67% of those using mechanical cultivation use 4-row equipment, 14% use 6-row and 19% use 8-row)					
FERTILIZATION	Pre Plant				100%	
	Aerial Application				4%	
	Bedder	8	24	190	4%	
	Custom				76%	
	Disk		15	150	4%	
	Fertilizer Cart			130	4%	
	Marker	4	12	170	8%	
	Marker	6	18	150	4%	
	Marker	8	24	180	20%	
	Ripper/Marker	4	12	190	4%	
At Plant				12%		
Planter	4	12	140	100%		

Table 3. (cont.) A Summary of Southcentral Idaho Commercial Potato Growers' Field Operations for 1995.

Input Category	Implement	Average No. of Rows	Average Width	Average Tractor HP	% Usage/No. of Responses	Average No. of Operations
FERTILIZATION	Post Plant				96%	
	Aerial Application				33%	
	Custom				13%	
	Fertilizer Cart			115	13%	
	Irrigation System				75%	
	Sprayer	12	36	150	4%	
	Spreader	12	36	145	17%	
PESTICIDE APPLICATION	Fumigants				36%	1.0
	Custom				22%	
	Irrigation System				78%	
	Ripper		15	200	11%	
	Pre & At Plant Insecticides				68%	1.1
	Disk		15	150	6%	
	Marker	4	12	160	12%	
	Planter	4	12	145	94%	
	Post Plant Insecticides				32%	1.6
	Aerial Application				75%	
	Irrigation System				25%	
	Rolling Cultivator	4	12	160	25%	
	Pre-Plant Herbicides				8%	1.0
	Coil Shank	8	24	320	50%	
	Disk		15	150	50%	
	Post Plant Herbicides				100%	1.2
	Aerial Application				8%	
	Custom				16%	
	Dammer Diker	6	18	170	12%	
	Dammer Diker/Cultivator	8	24	250	4%	
	Ground Rig	18		175	4%	
Irrigation System				44%		
Pull Spreader		50	60	4%		
Rolling Cultivator	6	18	140	8%		
9 Shank	8	24	105	4%		
Sprayer	20	60	140	16%		
Post Plant Fungicide				92%	2.8	
Aerial Application				87%		
Irrigation System				30%		

Table 3. (cont.) A Summary of Southcentral Idaho Commercial Potato Growers' Field Operations for 1995.

Input Category	Implement	Average No. of Rows	Average Width	Average Tractor HP	% Usage/No. of Responses	Average No. of Operations
PESTICIDE APPLICATION	At or Post Vine Kill Fungicide				12%	1.0
	Custom				100%	
DEFOLIATION	Vine Roll				64%	
	Vine Roller	4	12	100	50%	
	Vine Roller	6	18	120	44%	
	Vine Roller	?		?	6%	
	Vine Kill				80%	
	Mechanical Only				40%	
	Mechanical/Chemical				15%	
	Chemical Only				40%	
	Not Specified				5%	
	Vine Kill - Mechanical				55%	
	Vine Beater	4	12	145	36%	
	Vine Beater	6	18	180	18%	
	Vine Beater	8	24	200	9%	
	Vine Chopper	6	18	140	18%	
	Vine Shredder	4	12	130	9%	
	Vine Shredder	6	18	150	9%	
	HARVEST					100%
Potato Harvester		2	6	140	64%	
2 Potato Harvesters		2	6	160	16%	
Potato Harvester		4	12	195	16%	
2 Potato Harvesters		4	12	195	4%	
Potato Windrower		2	6	135	36%	
4 Potato Windrowers		2	6	175	4%	
Potato Windrower		4	12	195	28%	
2 Potato Windrowers		4	12	190	4%	