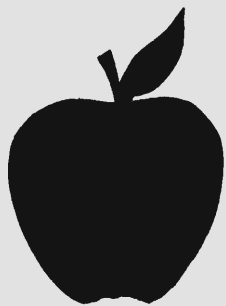


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THE COST  
OF ESTABLISHING  
AN APPLE ORCHARD ON



# **SEMI-DWARFING ROOTSTOCK**

COLUMBIA BASIN  
WASHINGTON

THE COST OF ESTABLISHING AN APPLE ORCHARD  
ON SEMI-DWARFING ROOTSTOCK  
COLUMBIA BASIN, WASHINGTON

by  
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INTRODUCTION

As the Columbia Basin Project area matures, fruit production will be more important to its economy. In 1958 Brough and Walker anticipated 25,254 acres of the land now irrigated would be in tree fruits when the area reaches maturity.<sup>2/</sup> Tree fruits had been planted on 3,365 acres of project land by 1966. Apples, the major tree fruits, increased from 845 acres in 1962 to 2,032 acres in 1966, as shown below. Another 400 acres of apples are on land immediately adjacent to the project area.

<u>Year</u>	<u>Tree Fruits</u>			<u>Apples</u>
	<u>Total</u>	<u>Bearing</u>	Non- <u>Bearing</u>	<u>Total</u>
1962	1,555	b/	b/	845
1963	2,253	995	1,258	1,250
1964	2,608	1,211	1,397	1,484
1965	3,163	1,210	1,953	1,856
1966	3,365	1,805	1,560	2,032

a/ Data from U.S. Bureau of Reclamation annual crop reports.

b/ Data not available.

Columbia Basin apple orchards are being established on standard, semi-dwarfing and full-dwarfing rootstock. A recent survey revealed that 851 acres, or 35 percent of the area's apple plantings, are on standard rootstock. Fifty-two percent, or 1,265 acres, are on semi-dwarfing rootstock while 316 acres, or 13 percent, are on full-dwarfing rootstock.

Apple trees on semi-dwarfing rootstock normally require five years for establishment in central Washington. After five years they should produce enough fruit to pay their annual costs and provide a reasonable return to orchardists for investment, labor and management. Trees on full-dwarfing rootstock usually bear fruit two years earlier than trees on semi-dwarfing rootstock and four years earlier than trees on standard rootstock.

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<sup>2/</sup> O. L. Brough and A. L. Walker, Crop and Livestock Production Possibilities, Columbia Basin Project, Washington, Stations Circular 239 Revised, Wash. Agric. Exp. Stations and U.S. Bureau of Reclamation, March 1958.

OBJECTIVE OF THIS ENTERPRISE STUDY

What does it cost to bring an apple orchard into production in the Columbia Basin? This question is frequently asked by growers, prospective growers and credit representatives.

In 1965 and 1966, studies were conducted in the area on the cost of establishing apple orchards on standard, semi-dwarfing and full-dwarfing rootstocks. This study shows the per acre cost of establishing a 15-acre apple orchard on semi-dwarfing rootstock on a diversified Columbia Basin farm with 150 irrigated acres. Results of the other studies were published as E.M. 2832, "The Cost of Establishing an Apple Orchard on Standard Rootstock, Columbia Basin, Washington" and E.M. 2834, "The Cost of Establishing an Apple Orchard on Full-Dwarfing Rootstock, Columbia Basin, Washington."

The information obtained through this study is useful for:

1. Prospective growers wanting to budget their financial needs on an annual basis while establishing an apple orchard on semi-dwarfing rootstock.
2. Credit representatives wanting information on the cost of establishing an apple orchard.
3. Buyers and sellers wanting to determine the value of an orchard during its development and at the end of the development period.
4. Orchardists needing to determine an orchard depreciation schedule.

The study is for a rill-irrigated orchard with one-half Red Delicious and one-half Golden Delicious trees. At the present time this combination is desirable for adequate pollination and because of the price of Golden Delicious.

This publication is not intended as a guide of the cultural practices needed to properly establish an apple orchard in the Columbia Basin. Such information is available from other publications, area orchardists, commercial fieldmen, Extension agents and others familiar with local conditions and the problems of orchard establishment.

METHOD OF OBTAINING DATA

The data were compiled from information obtained from a selected group of experienced apple growers in Grant and Adams counties. A committee of six growers assisted in interpreting and compiling the information. The figures shown are not averages, but represent the expected costs for a typical 15-acre planting on a diversified Columbia Basin farm with 150 irrigable acres.

The information in this enterprise study is useful for growers and prospective growers as a basic guide, but should be used only until more factual data are available from records of their own operation. Space is provided in each table so operators can insert actual cost data as it becomes available from their farm records.

SUMMARY OF ESTABLISHMENT COSTS

Annual costs during the five-year development period for an apple orchard on semi-dwarfing rootstock are summarized in Table 1. They are grouped into planting, growing, harvest, cash overhead and investment overhead costs. Expected crop yields and value during the establishment years are also shown. Details of the investment on equipment and buildings are shown in Table 7.

The five-year establishment cost was determined to be \$1710.59 per acres, or \$6.38 per tree, for a 15-acre planting with 268 trees per acre. This amount does not include purchase price of the land and irrigation system but does include annual charges for depreciation and interest on investment for these items.

ANNUAL COSTS DURING ESTABLISHMENT

Annual costs are shown in more detail in Table 2 through Table 6. The cash costs were computed for each year by determining the necessary practices and the associated costs for labor, machinery use, materials, etc. The non-cash costs due to operator's labor, investment overhead and interest on accumulated investment were then added to the cash costs to determine the total annual costs.

Table 2. First Year of Establishment

This study is for an orchard with one-half Golden Delicious and one-half Red Delicious trees on semi-dwarfing rootstocks (M 26, M VII, or MM 106). Orchards are usually planted in land that has been in a crop at least one year. Therefore, discing before planting is usually adequate land preparation.

Various planting patterns are used for trees on semi-dwarfing rootstock. Most orchardists allow 18 feet between rows in semi-dwarf plantings to facilitate use of their machinery. This study is based on the trees being nine feet apart in the rows, which results in 268 trees per acre. The chart below shows the trees per acre for various distances between trees in the row when the rows are 18 feet apart.

Distance between trees	8'	9'	10'	11'	12'	13'	14'
Trees per acre	302	268	242	220	201	186	172

The planting costs were \$1.16 per acre for discing, \$375.20 for trees, and \$38.35 per acre for tree location, planting and watering. First year growing costs totaled \$83.05 per acre with \$62.80 due to weeding, cultivation and irrigation labor. Fertilizer is not usually applied the year an orchard is planted.

The CASH OVERHEAD is for property taxes, irrigation water, general overhead and interest on operating capital. A charge of 5 percent of the cash costs was included each year as GENERAL OVERHEAD to cover such unitemized expenses as utilities, insurance, office expenses, social security, travel, etc. The INVESTMENT OVERHEAD consists of DEPRECIATION of equipment and buildings and INTEREST ON INVESTMENT in equipment, buildings and land. Details of the amount charged as investment overhead are shown in Table 7. The TOTAL ANNUAL COSTS for the first year were \$586.92 per acre.

Table 3. Second Year of Establishment

Orchardists normally replant about two percent of the trees; most of the replanting is done by hand labor in the second year. The allowance for replanting was \$9.80 per acre.

Chemical weed control and one cover spray are common in the second year. Therefore a weed sprayer and air blast sprayer are added to capital investment, as shown in Table 7. Pruning costs were eight cents per tree. Up to one-quarter pound of nitrogen fertilizer per tree is applied in the second year, depending on soil conditions, irrigation practices and the previous cropping practices.

The growing costs were \$106.98 per acre. The cash overhead and investment overhead expenses were determined in the same manner used the first year. An additional charge of \$35.22 per acre was made to cover the INTEREST ON ACCUMULATED INVESTMENT for the first year's operation. The TOTAL ANNUAL COSTS for the second year of establishing apple trees on semi-dwarfing rootstock were \$238.96 per acre.

Table 4. Third Year of Establishment

Many of the cultural practices are the same as the second year. Pruning costs increased to 14 cents per tree. This study is based on "mold and hold" pruning. However, orchardists that plan to install stakes for tree support should do it in the third year; the cost of staking, as well as the cost of the stakes, would be inserted in Table 4. A grass sod cover crop is normally established in the third summer. The cover crop restricts weed growth in subsequent years, but increases the need for nitrogen fertilizer.

The third year growing costs were \$140.21 per acre. The cash overhead and non-cash costs were determined in the same manner used for the second year. The TOTAL ANNUAL COSTS were \$277.72 per acre.

Table 5. Fourth Year of Establishment

Application of nitrogen fertilizer increases in the fourth year due to the cover crop that was established the previous year. Beating the grass cover crop replaces mechanical cultivation. One dormant, or delayed-dormant, and three cover sprays should be applied to control pests on the bearing trees. The committee estimated thinning costs at \$17.50 per acre with most of the thinning on the Golden Delicious trees. The growing costs were \$225.62 per acre.

Two and one-quarter tons of fruit per acre were estimated for the fourth year. Most of the fruit will be from the Golden Delicious trees, which are 50 percent of the planting. They produce fruit sooner than Red Delicious. The quality of fruit from trees during their initial years of production is not equal to fruit produced by older trees. Therefore, value of the crop was based on \$50.00 per ton; the price received for fruit sold to the processors.

A young 15-acre orchard is usually picked by a small crew, about six pickers, over a 10 to 15-day period. Five dollars per bin picking costs is higher than

normal but was used because of the less desirable picking of young trees. The cost of moving bins in the orchard was also greater because of the low yield per tree. Harvest supervision in a young orchard of this size is usually handled by the farm operator. Harvest costs due to picking, bin hauling, field supervision and fall cleanup were estimated to be \$55.59 per acre. TOTAL ANNUAL COSTS were \$465.12 per acre in the fourth year. These costs were reduced \$112.50 per acre by the value of the apples that were harvested.

Table 6. Fifth Year of Establishment

Some Columbia Basin orchards will need an application of zinc fertilizer by the fifth year. Also some will need to be sprayed with boron when they start producing fruit. Thinning costs are increased with a larger Golden Delicious crop and some thinning on the Red Delicious. Other growing costs are similar to the fourth year. Growing costs totaled \$301.62 per acre.

Fifth year crop yield and picking costs will vary greatly from orchard to orchard, depending upon the yield resulting from orchard management since planting. Most of the crop will be Golden Delicious with a light crop expected on the Red Delicious trees. Picking costs were reduced from the fourth year to \$4.50 per bin, because of the increased yield per acre. The cost of bin distribution and hauling was also reduced for the same reason. Harvest costs and fall cleanup totaled \$161.19 per acre. TOTAL ANNUAL COSTS were \$681.87 per acre. A fruit crop valued at \$427.50 per acre will result in a fifth year establishment cost of \$254.37 per acre.

INVESTMENT IN EQUIPMENT, BUILDINGS AND LAND

The expected capital investment in equipment, buildings and land for a 15-acre orchard is shown in Table 7. Most of the items are also useful for other enterprises on the farm, so only a portion of their annual depreciation and interest on investment is charged against the orchard enterprise. Many items would be on hand before planting the orchard; others are shown as being purchased the year they are needed. Farmers with only a few acres of orchard should prepare a partial budget to help them determine the advisability of owning such items as an air blast sprayer, a beater for the cover crops, etc. Also shown are the cash costs per hour of use for the various items of equipment.

TABLE 1. SUMMARY OF ESTABLISHMENT COSTS PER ACRE,  
 APPLE TREES ON SEMI-DWARFING ROOTSTOCK<sup>1/</sup>  
 COLUMBIA BASIN, WASHINGTON  
 (1966)

	First Year	Your Estimate	Second Year	Your Estimate	Third Year	Your Estimate
Land preparation	\$ 1.16	\$	\$	\$	\$	\$
Tree location, staking	20.13					
Trees	375.20		7.00			
Dig holes, plant, water	18.22		2.80			
<b>PLANTING COSTS</b>	<b>414.71</b>		<b>9.80</b>			
Prune, train, brush removal	3.50		21.44		37.50	
Rodent control	7.96		7.96		7.96	
Fertilize			15.70		15.70	
Irrigation - corrugation	8.79		8.79		7.57	
- labor	28.00		28.00		28.00	
Cultivation	8.55		8.55		5.83	
Weed control	26.25		11.05		11.05	
Pest control (spray)			5.49		16.48	
Cover crop					10.12	
<b>GROWING COSTS</b>	<b>83.05</b>		<b>106.98</b>		<b>140.21</b>	
Taxes	6.00		6.00		6.00	
Water	10.00		10.00		10.00	
General Overhead	22.00		3.00		3.00	
Interest on Operating Capital	16.00		2.00		3.00	
<b>TOTAL CASH AND LABOR COSTS</b>	<b>551.76</b>		<b>137.78</b>		<b>162.21</b>	
Deprec. of Equip., Bldgs.	13.94		34.48		34.48	
Int. on Equip., Bldgs., Land	21.22		31.48		31.48	
Int. on Accum. Invest. (6%)			35.22		49.55	
<b>TOTAL ANNUAL COSTS</b>	<b>586.92</b>		<b>238.96</b>		<b>277.72</b>	
Yield - Tons per acre						
Crop value @ \$50 per ton						
<b>ANNUAL INCOME</b>	<b>-586.92</b>		<b>-238.96</b>		<b>-277.72</b>	
<b>ACCUMULATED INVESTMENT</b>	<b>586.92</b>		<b>825.88</b>		<b>1,103.60</b>	

<sup>1/</sup> Based on establishing a 15-acre apple orchard on semi-dwarfing rootstock

TABLE 1 (Cont'd.) SUMMARY OF ESTABLISHMENT COSTS PER ACRE,  
 APPLE TREES ON SEMI-DWARFING ROOTSTOCK  
 COLUMBIA BASIN, WASHINGTON  
 (1966)

	Fourth Year	Your Estimate	Fifth Year	Your Estimate
	\$	\$	\$	\$
Prune, train, brush removal	53.60		110.39	
Rodent control	7.96		9.86	
Fertilize	14.94		22.88	
Irrigation - corrugation	4.40		4.40	
- labor	28.00		28.00	
Weed control	15.05		15.05	
Pest control (spray)	75.94		75.94	
Cover crop	8.23		12.35	
Thinning	17.50		22.75	
<b>GROWING COSTS</b>	<b>225.62</b>		<b>301.62</b>	
Picking	25.00		85.50	
Hauling, bin distribution	25.00		66.50	
Supervise harvest	4.00		6.00	
Cleanup	1.59		3.19	
<b>HARVEST AND CLEANUP</b>	<b>55.59</b>		<b>161.19</b>	
Taxes	6.00		6.00	
Water	10.00		10.00	
General Overhead	10.00		18.00	
Interest on Operating Capital	7.00		13.00	
<b>TOTAL CASH AND LABOR COSTS</b>	<b>314.21</b>		<b>509.81</b>	
Deprec. of Equip., Bldgs.	48.22		48.22	
Interest on Equip., Bldgs., Land	36.47		36.47	
Int. on Accum. Invest. (6%)	66.22		87.37	
<b>TOTAL ANNUAL COSTS</b>	<b>465.12</b>		<b>681.87</b>	
Yield - Tons per acre <sup>2/</sup>	2.25T		8.55T	
Crop value @ \$50 per ton <sup>3/</sup>	112.50		427.50	
<b>ANNUAL INCOME</b>	<b>-352.62</b>		<b>-254.37</b>	
<b>ACCUMULATED INVESTMENT</b>	<b>1,456.22</b>		<b>1,710.59</b>	

<sup>2/</sup> Yield in initial years can vary greatly from orchard to orchard depending on location, weather, management, type and quality of trees planted, etc.

<sup>3/</sup> Value of the crop was based on processing price due to lower quality of fruit in initial years of establishment.



TABLE 2. ESTIMATED PER ACRE ANNUAL COST OF ESTABLISHING  
AN APPLE ORCHARD ON SEMI-DWARFING ROOTSTOCK  
COLUMBIA BASIN, WASHINGTON  
(First Year)

	Hours Per Acre	Labor*	Machinery Fuel and Repairs	Materials & Other	Total	Your Estimate
		\$	\$	\$	\$	\$
Land preparation	.3	.52	.64		1.16	
Tree location, staking (9' x 18')	7.0	12.25**	2.88	5.00	20.13	
Trees (268 @ \$1.40)				375.20	375.20	
Dig holes, plant, water	7.0	12.25**	5.97		18.22	
<b>PLANTING COSTS</b>					<b>414.71</b>	
Rodent control <sup>1/</sup>	1.1	1.92	1.64	4.40	7.96	
Fertilizer <sup>2/</sup>						
Corrugation, 4x	2.8	4.90	3.89		8.79	
Irrigation labor, 12x <sup>3/</sup>	16.0	28.00			28.00	
Cultivation, 3x	2.2	3.85	4.70		8.55	
Weed control (hand)	15.0	26.25**			26.25	
Pest control						
Establish cover crop						
Prune & train (summer)	2.0	3.50			3.50	
<b>GROWING COSTS</b>					<b>83.05</b>	
<b>Cash Overhead<sup>4/</sup></b>						
Taxes				6.00	6.00	
Water				10.00	10.00	
General Overhead (5% of cash costs)				22.00	22.00	
Interest on Oper. Capital (6 mo. @ 7%)				16.00	16.00	
<b>TOTAL CASH COSTS PER ACRE</b>		<b>25.38</b>	<b>19.72</b>	<b>438.60</b>	<b>483.70</b>	
Operator's Labor		68.06			68.06	
<b>Investment Overhead</b>						
Depreciation				13.94	13.94	
Interest on investment				21.22	21.22	
<b>TOTAL NON-CASH COSTS PER ACRE</b>		<b>68.06</b>		<b>35.16</b>	<b>103.22</b>	
<b>TOTAL ANNUAL COSTS PER ACRE</b>		<b>93.44</b>	<b>19.72</b>	<b>473.76</b>	<b>586.92</b>	

\* Labor charged at \$1.75 per hour.

\*\* Some of these operations commonly hired.

<sup>1/</sup>Consult your county agent for local recommendations on specific cultural practices.

<sup>2/</sup>Fertilizer not usually applied around the trees during the first year. Nitrogen is needed only when large amounts of crop residue are plowed down before planting.

<sup>3/</sup>Irrigation costs based on rill (corrugate) irrigation; costs will vary by type of irrigation. Frequency of irrigation depends on water holding capacity of the soil and water applied each time.

<sup>4/</sup>Rounded to nearest dollar.

TABLE 3. ESTIMATED PER ACRE ANNUAL COST OF ESTABLISHING  
AN APPLE ORCHARD ON SEMI-DWARFING ROOTSTOCK  
COLUMBIA BASIN, WASHINGTON  
(Second Year)

	Hours Per Acre	Labor*	Machinery Fuel and Repairs	Materials & Other	Total	Your Estimate
		\$	\$	\$	\$	
Trees (5 @ \$1.40) (2%)				7.00	7.00	
Dig holes, plant, water	1.6	2.80			2.80	
<b>REPLANTING COSTS</b>					<b>9.80</b>	
Prune and train (8¢ per tree)	12.25	21.44			21.44	
Rodent control	1.1	1.92	1.64	4.40	7.96	
Fertilizer (67 N @ 13¢) <sup>1/</sup>	4.0	7.00		8.70	15.70	
Corrugation, 4x	2.8	4.90	3.89		8.79	
Irrigation labor, 12x	16.0	28.00			28.00	
Cultivation, 3x	2.2	3.85	4.70		8.55	
Weed control, 2x (chemical) <sup>2/</sup>	1.1	1.92	2.13	7.00	11.05	
Pest control, 1x (spray)	.5	.87	1.62	3.00	5.49	
<b>GROWING COSTS</b>					<b>106.98</b>	
<b>Cash Overhead<sup>3/</sup></b>						
Taxes				6.00	6.00	
Water				10.00	10.00	
General Overhead				3.00	3.00	
Interest on Oper. Capital				2.00	2.00	
<b>TOTAL CASH COSTS PER ACRE</b>			<b>13.98</b>	<b>51.10</b>	<b>65.08</b>	
Operator's Labor		72.70			72.70	
<b>Investment Overhead<sup>4/</sup></b>						
Depreciation				34.48	34.48	
Interest on Investment				31.48	31.48	
Interest on accum. investment <sup>5/</sup>				35.22	35.22	
<b>TOTAL NON-CASH COSTS PER ACRE</b>		<b>72.70</b>		<b>101.18</b>	<b>173.88</b>	
<b>TOTAL ANNUAL COSTS PER ACRE</b>		<b>72.70</b>	<b>13.98</b>	<b>152.28</b>	<b>238.96</b>	

\* Labor charged at \$1.75 per hour.

<sup>1/</sup> Fertilizer hand applied under trees during dormant season or early spring. Nitrogen needs should be determined according to leaf analysis, soil tests and previous years' tree growth.

<sup>2/</sup> Chemical costs will vary with material used.

<sup>3/</sup> Rounded to nearest dollar.

<sup>4/</sup> Investment overhead increased due to purchase of additional equipment.

<sup>5/</sup> Based on 6 percent of ACCUMULATED INVESTMENT for first year as shown in Table 1.

TABLE 4. ESTIMATED PER ACRE ANNUAL COST OF ESTABLISHING  
AN APPLE ORCHARD ON SEMI-DWARFING ROOTSTOCK  
COLUMBIA BASIN, WASHINGTON  
(Third Year)

	Hours Per Acre	Labor* \$	Machinery Fuel and Repairs \$	Materials & Other \$	Total \$	Your Estimate \$
<b>REPLANTING COSTS</b>						
Prune and train (14¢ per tree)	21.5	37.50**			37.50	
Brush removal						
Rodent control	1.1	1.92	1.64	4.40	7.96	
Fertilizer (67 N @ 13¢) <sup>1/</sup>	4.0	7.00		8.70	15.70	
Corrugation, 3x	2.1	3.68	3.89		7.57	
Irrigation labor, 12x	16.0	28.00			28.00	
Cultivation, 2x	1.5	2.62	3.21		5.83	
Weed control, 2x (chemical)	1.1	1.92	2.13	7.00	11.05	
Pest control, 2x (spray)	1.1	1.92	3.56	11.00	16.48	
Establish grass cover	1.1	1.92	2.20		4.12	
- grass seed (8# @ 75¢)				6.00	6.00	
Tree staking <sup>2/</sup>						
<b>GROWING COSTS</b>					140.21	
<b>Cash Overhead<sup>3/</sup></b>						
Taxes				6.00	6.00	
Water				10.00	10.00	
General Overhead				3.00	3.00	
Interest on Oper. Capital				3.00	3.00	
<b>TOTAL CASH COSTS PER ACRE</b>		18.75	16.63	59.10	94.48	
Operator's Labor		67.73			67.73	
<b>Investment Overhead</b>						
Depreciation				34.48	34.48	
Interest on Investment				31.48	31.48	
Interest on Accum. Investment <sup>4/</sup>				49.55	49.55	
<b>TOTAL NON-CASH COSTS PER ACRE</b>		67.73		115.51	183.24	
<b>TOTAL ANNUAL COSTS PER ACRE</b>		86.48	16.63	174.61	277.72	

\* Labor charged at \$1.75 per hour.

\*\* Some of these operations commonly hired.

<sup>1/</sup> Zinc may be needed by third year. See Table 6 for costs.

<sup>2/</sup> Tree staking may be needed for some varieties, depending on location and soil conditions.

<sup>3/</sup> Rounded to nearest dollar.

<sup>4/</sup> Based on 6 percent of ACCUMULATED INVESTMENT for the previous year as shown in Table 1.

TABLE 5. ESTIMATED PER ACRE ANNUAL COST OF ESTABLISHING  
AN APPLE ORCHARD ON SEMI-DWARFING ROOTSTOCK  
COLUMBIA BASIN, WASHINGTON  
(Fourth Year)

	Hours Per Acre	Labor*	Machinery Fuel and Repairs	Materials & Other	Total	Your Estimate
		\$	\$	\$	\$	\$
Prune and train (20¢ per tree)	30.6	53.60**			53.60	
Brush removal						
Rodent control	1.1	1.92	1.64	4.40	7.96	
Fertilizer (100 N @ 13¢) <sup>1/</sup>	.6	1.05	.89	13.00	14.94	
- Zinc <sup>2/</sup>						
- Boron <sup>2/</sup>						
Corrugation, 2x	1.4	2.45	1.95		4.40	
Irrigation labor, 12x	16.0	28.00			28.00	
Weed control, 2x (chemical)	1.1	1.92	2.13	11.00	15.05	
Pest control						
1 delayed-dormant	.6	1.05	1.94	1.37	4.36	
3 cover sprays	2.0	3.50	6.48	61.60	71.58	
Beat grass cover, 2x	2.2	3.85	4.38		8.23	
Thinning (Goldens)	10.0	17.50**			17.50	
<b>GROWING COSTS</b>					<b>55.59</b>	
Picking (5 bins @ \$5.00) <sup>3/</sup>		25.00**			25.00	
Bin distribution, hauling (5 @ \$5.00)				25.00	25.00	
Supervise picking (\$2.00 per hr.)	2.0	4.00			4.00	
Fall cleanup	.5	.87	.72		1.59	
<b>HARVEST AND FALL CLEANUP</b>					<b>225.62</b>	
<b>Cash Overhead<sup>4/</sup></b>						
Taxes				6.00	6.00	
Water				10.00	10.00	
General Overhead				10.00	10.00	
Interest on Oper. Capital				7.00	7.00	
<b>TOTAL CASH COSTS PER ACRE</b>		<b>48.05</b>	<b>20.13</b>	<b>149.37</b>	<b>217.55</b>	
Operator's Labor		96.66			96.66	
<b>Investment Overhead</b>						
Depreciation				48.22	48.22	
Interest on Investment				36.47	36.47	
Interest on Accum. Investment <sup>5/</sup>				66.22	66.22	
<b>TOTAL NON-CASH COSTS PER ACRE</b>		<b>96.66</b>		<b>150.91</b>	<b>247.57</b>	
<b>TOTAL ANNUAL COSTS PER ACRE</b>		<b>144.71</b>	<b>20.13</b>	<b>300.28</b>	<b>465.12</b>	

\* Labor charged at \$1.75 per hour.

\*\* Some of these operations commonly hired.

<sup>1/</sup> Nitrogen for trees and cover crop applied by fertilizer spreader.

<sup>2/</sup> Yield in initial years can vary greatly from orchard to orchard depending on location, weather, management, type and quality of trees planted, etc.

<sup>3/</sup> Apply zinc and boron as needed; boron may be applied with cover spray. See Table 6 for costs.

<sup>4/</sup> Rounded to nearest dollar.

<sup>5/</sup> Based on 6 percent of ACCUMULATED INVESTMENT for the previous year as shown in Table 1.

TABLE 6. ESTIMATED PER ACRE ANNUAL COST OF ESTABLISHING  
AN APPLE ORCHARD ON SEMI-DWARFING ROOTSTOCK  
COLUMBIA BASIN, WASHINGTON  
(Fifth Year)

	Hours Per Acre	Labor* \$	Machinery Fuel and Repairs \$	Materials & Other \$	Total \$	Your Estimate \$
Prune and train (40¢ per tree)	61.2	107.20**			107.20	
Brush removal	1.0	1.75	1.44		3.19	
Rodent control	1.5	2.62	2.24	5.00	9.86	
Fertilizer (100# N @ 13¢) <sup>1/</sup>	.6	1.05	.89	13.00	14.94	
- Zinc (10# @ 42¢) <sup>2/</sup>	.6	1.05	1.94	4.20	7.19	
- Boron (5# @ 15¢) <sup>2/</sup>				.75	.75	
Corrugation, 2x	1.4	2.45	1.95		4.40	
Irrigation labor, 12x	16.0	28.00			28.00	
Weed control, 2x (chemical)	1.1	1.92	2.13	11.00	15.05	
Pest control						
1 delayed-dormant	.6	1.05	1.94	1.37	4.36	
3 cover sprays	2.0	3.50	6.48	61.60	71.58	
Beat grass cover, 3x	3.3	5.78	6.57		12.35	
Thinning	13.0	22.75**			22.75	
Propping						
<b>GROWING COSTS</b>					<b>301.62</b>	
Picking (19 bins @ \$4.50) <sup>3/</sup>		85.50**			85.50	
Bin distr., hauling (19 @ \$3.50)				66.50	66.50	
Picking supervision (\$2.00 per hr.)	3.0	6.00			6.00	
Fall cleanup	1.0	1.75	1.44		3.19	
<b>HARVEST AND FALL CLEANUP</b>					<b>161.19</b>	
<b>Cash Overhead<sup>4/</sup></b>						
Taxes				6.00	6.00	
Water				10.00	10.00	
General Overhead				18.00	18.00	
Interest on Oper. Capital				13.00	13.00	
<b>TOTAL CASH COSTS PER ACRE</b>		<b>150.00</b>	<b>27.02</b>	<b>210.42</b>	<b>387.44</b>	
Operator's Labor		122.37			122.37	
<b>Investment Overhead</b>						
Depreciation				48.22	48.22	
Interest on Investment				36.47	36.47	
Interest on Accum. Investment <sup>5/</sup>				87.37	87.37	
<b>TOTAL NON-CASH COSTS PER ACRE</b>		<b>122.37</b>		<b>172.06</b>	<b>294.43</b>	
<b>TOTAL ANNUAL COSTS PER ACRE</b>		<b>272.37</b>	<b>27.02</b>	<b>382.48</b>	<b>681.87</b>	

\* Labor charged at \$1.75 per hour.

\*\* Some of these operations commonly hired.

<sup>1/</sup> Nitrogen for trees and cover crop applied by spreader.

<sup>2/</sup> Apply zinc and boron as needed; boron may be applied with cover spray.

<sup>3/</sup> Yield in initial years can vary greatly from orchard to orchard depending on location, weather, management, type and quality of trees planted, etc.

<sup>4/</sup> Rounded to nearest dollar.

<sup>5/</sup> Based on 6 percent of ACCUMULATED INVESTMENT for the previous year as shown in Table 1.

TABLE 7. EXPECTED INVESTMENT, ANNUAL COSTS AND CASH COSTS FOR EQUIPMENT, BUILDINGS AND LAND \*

Item	Year Purch. <sup>2/</sup>	Purch. Price	Salvage Value	Average Value	% Due to Establ.	Method of Deprec. <sup>1/</sup>	Annual Costs		Annual Costs (Your Estimate)		Cash Costs Per Hour		
							Deprec.	Int.(6%)	Deprec.	Int.(6%)	Fuel	Repairs	Total
Tractor	0	\$ 5,000	\$ 1,000	\$ 3,000	10	8 SL	\$ 50.00	\$ 18.00	\$	\$	\$ .68	\$ .56	\$ 1.24
Offset disc, 10'	0	1,000	250	625	10	10 SL	7.50	3.75				.90	.90
Corrugator	0	200	40	120	10	8 SL	2.00	.72				.15	.15
Trailer	0	500	150	325	20	10 SL	7.00	3.90				.20	.20
Fert. spread., 8'	0	300	50	175	5	5 SL	2.50	.52				.25	.25
Pickup	0	2,400	500	1,450	5	8 SL	11.88	4.35			.03	.02	.05 <sup>3/</sup>
Truck	0	5,600	1,500	3,550	5	8 SL	25.62	10.65			.05	.04	.09 <sup>3/</sup>
Shop, storage bldgs.	0	5,000	0	2,500	10	25 SL	20.00	15.00					
Shop equipment	0	2,000	0	1,000	10	10 SL	20.00	6.00					
Pruning equip. (hand)	1	45	0	22	100	10 SL	4.50	1.35					
Tree auger	1	250	50	150	100	10 SL	20.00	9.00				.75	.75
Gopher machine	1	350	150	250	33	7 SL	9.52	5.00				.25	.25
Mice bait machine	1	350	150	250	100	7 SL	28.57	15.00				.25	.25
Air blast sprayer	2	4,000	1,000	2,500	100	10 SL	300.00	150.00			.40	1.60	2.00
Weed sprayer	2	425	100	262	25	10 SL	8.12	3.94			.30	.40	.70
Beater	4	1,000	150	575	100	7 SL	121.42	34.50				.75	.75
Fork lift	4	1,000	250	625	100	10 SL	75.00	37.50				.50	.50
Ladders, 6	4	36	0	18	100	10 SL	3.60	1.08					
Picking bags, 6	4	60	0	30	100	10 SL	6.00	1.80					
Land, \$500 per acre <sup>5/</sup>	0	7,500		7,500	100			225.00					
TOTAL							209.09	318.24					
YOUR TOTAL													
PER ACRE							13.94 <sup>4/</sup>	21.22 <sup>4/</sup>					
YOUR COST													

\* Based on establishing 15 acres of apples on semi-dwarfing rootstock on a 150-acre diversified farm.

<sup>1/</sup> Straight line method of depreciation used; the number (8) indicates years of expected use.

<sup>2/</sup> Items designed "0" usually on hand prior to planting the orchard.

<sup>3/</sup> Cash costs per mile.

<sup>4/</sup> Depreciation and interest during initial two years; increases in later years due to equipment purchases.

<sup>5/</sup> Includes cost of irrigation system.