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ORCHARD SURVEY OF THE ARKANSAS VALLEY DISTRICT

By E. P. SANDSTEN and C. M. TOMPKINS

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ORCHARD SURVEY OF THE ARKANSAS VALLEY DISTRICT

By E. P. SANDSTEN AND C. M. TOMPKINS

This district extends from the mouth of the Grand Canon of the Arkansas River at Canon City in an easterly direction to La Junta, a distance of about 120 miles, and includes the following counties: Fremont, Pueblo, Crowley and Otero.

The area adapted to tree fruits is confined to two rather narrow and broken strips of lands on both sides of the Arkansas River. The better orchard land is mostly confined to the second river level. The upper portion of the valley from Canon City to south of Florence is quite extensive, and consists of series of terraces and slopes which provide excellent soil and air drainage. The bottom lands are quite level with a gradual slope toward the river and in the direction of the flow of the river. The river-bottom land is in most cases unsuited for fruit trees, being subject to late spring frosts, and it also lacks both soil and air drainage. In the vicinity of Pueblo the best fruit-lands are located on the bench some distance from the river. The valley at this point is broad and the bench land merges into the plains. Available water for irrigation is limited and fruit growing is necessarily confined to the irrigated section. In the lower portion of the district, in Otero and Crowley counties, the fruit lands are confined to the second river-level or on what may be termed the transition zone between the river bottom and the open plains. The soil in this portion of the district is sandy loam and well adapted to fruit trees. Due to the general level of the land, the air drainage is not as good as one would wish and consequently destructive spring frosts often occur. While this is true of the section as a whole, there are a number of fine orchards and orchard sites, especially in places where the land is broken up into ridges and slopes which provide the necessary air and soil drainage.

Taking the district as a whole, the orchard industry has probably reached its maximum development. This is especially true of the apples. In fact apple production is not as high there today as it was ten years ago. The cherry industry, on the other hand, shows a considerable expansion, especially in the Penrose or Beaver Creek section.

The decline in the apple industry is due to a number of causes, chiefly to the frequent occurrence of late spring frosts, and to the general neglect of the orchards. This is particularly true in the eastern part of the district. Suitable orchard sites are relatively scarce, and many of the earlier orchards were planted on poor sites. It is doubtful if commercial apple-growing in the district

will ever become profitable outside of a few favorable localities, especially in competition with more favorable sections. The sour cherry industry, however, is capable of considerable expansion.

CONDITION OF THE ORCHARDS

The majority of the orchards are in sod, or planted with small fruits or vegetables between the rows. Generally speaking, there is no well-defined system of cultivation, pruning, and spraying, and as a result the fruit is of lower quality than would be obtained under better cultural methods. This is natural, since most of the owners are not dependent entirely upon their returns from the fruit. The orchard is, in most cases, a side issue to other lines of agriculture Most of the trees are at an age when the fruit becomes smaller, less colored, and hence of lower value than is obtained from younger bearing trees. For this reason there is need for considerable improvement along the lines of pruning, cultivation and fertilization. The object of cultivation and fertilization is to stimulate the tree in making new wood. New wood is necessary to enable the trees to assimilate food for the production of fruit. The present condition of many orchards is such that even during a good fruit year, the trees can only produce small and inferior fruit.

Another decided drawback to fruit growing in the district is the large number of varieties planted. Not less than eighty-four varieties are listed, while ten to fifteen constitute practically all the standard commercial varieties that can be grown successfully in the district. Top-working these non-commercial varieties would materially increase the value of the orchards and facilitate the work of caring for the trees.

Many of the orchards are in alfalfa or some permanent hay crop. Only a few growers practice clean cultivation and fewer still practice a definite system of alternating cover crops with clean cultivation. Many orchards are used for the growing of hay and not a few growers use the orchards as a pasture for livestock. Neglect of the orchards is apparent, and if fruit growing is to be profitable in the future, the orchards must first be put in condition to support a normal crop.

SUGGESTIONS

Neglected and run-down orchards can be restored, in part at least, to normal productiveness. The method of restoration will necessarily vary with the condition of the trees and soil. As a rule both the trees and the soil need attention.

Where pruning has been neglected the trees are usually full of wood which must be thinned out. This will act as a stimulant to more vigorous wood growth and the storing up of reserve food for fruit bud formation. The pruning should be done from Febru-

ary to April, and should not be too severe. If a large number of branches have to be removed it is preferable to complete the pruning the second year. Make the cut close to the main branches and make clean and smooth cuts. Dressing the wounds is not necessary.

The land should be plowed as early as possible in the spring, and before plowing, a heavy dressing of well-rotted stable manure should be applied. Where the orchard has been in sod for several years the plowing should be shallow so as not to tear up the small feeding-roots which always come to the surface in sod orchards. A couple years of clean cultivation will send the roots downward and there will be no danger of disturbing them. An orchard that has been in sod for a number of years should be kept in clean cultivation for at least three years. Afterward the orchard should be kept alternately in some kind of cover crop and in clean cultivation.

A neglected orchard is never a paying proposition. Even during a good fruit year the trees are in no condition to produce a profitable crop. An orchard must be given yearly and seasonal attention if it is to do its best. If the orchard is to be neglected it is better to remove the trees and use the land for other crops.

Spraying is another necessity that is too often neglected. No profitable crop of fruit can be produced without thorough spraying.

MARKET FACILITIES

The Arkansas Valley district is ideally situated, both as to market and transportation. Its close proximity to Colorado Springs, Denver and other towns, makes the disposal of the orchard products simple and profitable. The local market in Pueblo is always excellent and practically all kinds of fruit are disposed of locally. In respect to prices obtained the district is better situated than any fruit district in the State. For distant market, the growers have a much lower freight rate than western Colorado, and on this account the growers realize a relatively higher profit.

CLIMATOLOGICAL DATA

The record of the U. S. Weather Bureau Station at Pueblo, shows the following data which is fairly representative of the whole Arkansas Valley fruit district. This is especially true of that portion of the valley east of Pueblo. The climate at Canon City, Fremont County, has a higher winter temperature and a greater winter precipitation, and consequently the more tender and long-season varieties can be grown successfully. Pears and grapes can be grown quite successfully in the Canon City section, but not east of Pueblo The climate is the limiting factor in fruit production in this district.

I. Precipitation in the region drained by the Arkansas River: Monthly, annual, and average amounts (in inches and hundredths).

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual	Average
Pueblo ...	0.34	0.58	0.67	1.84	1.63	1.31	1.98	1.70	0.85	0.62	0.51	0.50	12.52	1869-1916

Pueblo, Pueblo County, Colorado—Elevation 4,734 feet.

II. Average Monthly and Annual Snowfall.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.	Annual
Pueblo ...	27	3.6	6.1	4.1	2.3	0.2	0	0	0	T.	1.2	2.2	5.8	25.5

III. Average Number of Days with 0.01 Inch or More Precipitation.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Pueblo ...	27	4	5	6	6	7	7	9	8	4	4	3	4	67

IV. Mean Temperatures.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Pueblo ...	28	31.2	31.8	41.3	50.7	59.0	68.8	73.8	72.7	64.6	52.2	40.5	31.5	51.5

V. Mean Minimum Temperatures.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Pueblo ...	28	17.0	17.5	27.1	36.1	45.3	54.2	59.6	58.4	49.3	36.9	25.3	17.1	37.0

VI. Mean Maximum Texperatures.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Pueblo ...	28	45.2	46.0	55.5	64.5	72.7	83.5	88.0	87.1	80.0	67.4	55.7	45.9	66.0

VII. Highest Temperatures.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Pueblo ...	28	70	74	85	88	95	103	103	104	98	88	81	74	104

VIII. Lowest Temperatures.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Pueblo ...	28	-25	-27	-9	12	23	34	41	39	28	16	-17	-18	-27

IX. Frost Data.

	Length of Record (Years)	Average date of last killing frost in spring.	Average date of first killing frost in autumn.	Latest date of killing frost in spring.	Earliest date of killing frost in autumn.
Pueblo	25	Apr. 26	Oct. 8	May 23	Sept. 12

The city smoke hinders the formation of frost, while the topographic surroundings probably slightly favor frost formation, being lower than the ground to the east, north, and northwest.

I. Precipitation in the region drained by the Arkansas River: Monthly, annual, and average amounts (in inches and hundredths).

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual	Average
Rocky Ford	0.25	0.36	0.57	1.70	1.87	1.37	2.57	1.47	0.77	0.84	0.42	0.48	12.67	1888-1916

Rocky Ford, Otero County, Colorado—Elevation 4,177 feet.

II. Average Monthly and Annual Snowfall.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Rocky Ford	23	2.2	4.1	1.7	0.9	0.3	0	0	0	T.	1.6	1.7	5.4	17.9

III. Average Number of Days with 0.01 inch or more Precipitation.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Rocky Ford	24	1	2	2	4	5	3	5	4	3	2	2	2	35

IV. Mean Temperatures.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Rocky Ford	28	29.6	31.8	41.2	51.8	60.4	70.0	74.5	73.6	65.2	51.0	40.2	30.0	51.6

V. Mean Minimum Temperatures.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Rocky Ford	23	14.7	15.4	25.1	35.4	44.9	53.9	58.8	57.2	48.0	34.9	22.9	13.6	35.4

VI. Mean Maximum Temperatures.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Rocky Ford	23	46.8	48.3	59.0	68.3	76.6	86.2	90.0	89.4	82.4	70.9	58.3	45.7	68.5

VII. Highest Temperatures.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Rocky Ford	23	11	81	92	91	96	105	103	104	100	92	84	75	105

VIII. Lowest Temperatures.

	Length of Record (Years)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Rocky Ford	23	-22	-32	-8	15	18	36	41	42	27	13	-16	-23	-32

IX. Frost Data.

	Length of Record (Years)	Average date of last killing frost in spring.	Average date of first killing frost in autumn.	Latest date of killing frost in spring.	Earliest date of killing frost in autumn
Rocky Ford	24	Apr. 27	Oct. 7	May 15	Sept. 17

Station located in the broad valley of the Arkansas, and about a mile from that stream. Conditions typical of the valley, and not especially favorable or unfavorable to frost formation.

The survey shows that the district has 793 commercial orchards distributed as follows.

Fremont County	687 orchards
Pueblo County	28 orchards
Crowley County	18 orchards
Otero County	60 orchards
Total	793 orchards

The total number of apple trees in the district is 227,716, distributed as follows:

Fremont County	165,902 trees
Pueblo County	21,032 trees
Crowley County	16,432 trees
Otero County	24,350 trees
Total	227,716 apple trees

The total number of sour cherry trees in the district was found to be 121,723 distributed by counties as follows:

Fremont County	67,552 trees
Pueblo County	3,195 trees
Crowley County	21,277 trees
Otero County	29,699 trees
Total	121,723 trees

The total number of peach trees in the district was found to be 442, distributed as follows:

Fremont County	337 trees
Pueblo County	trees
Crowley County	trees
Otero County	105 trees
Total	442 trees

The summary shows the total number of plum trees in the district to be 2,784, distributed as follows:

Fremont County	2,674 trees
Pueblo County	trees
Crowley County	80 trees
Otero County	30 trees
Total	2,784 trees

FREMONT COUNTY

This county is the most highly and extensively developed fruit section of the district. It is a small section so far as area is concerned, being limited to the narrow valley and the narrow, adjacent, terrace land. Practically all available land is in orchards. The proximity to the high bluff on the west and northwest afford protection against the cold winds, making the average winter temperature considerably higher than any other district in eastern Colorado. The Beaver Creek or Penrose section, situated on a mesa about ten miles north of Florence, is a relatively new fruit district. The soil is of sandy loam texture and in many places too shallow for tree fruits, especially the apples. It is very doubtful if apple growing will ever be a success except in a few isolated areas. On the other hand, sour cherries and small fruits can be successfully grown. The small-fruit industry is capable of considerable expansion in Fremont County and more efforts should be devoted to the development of these crops Transportation facilities are excellent and there is a ready market for the products.

GENERAL CONDITIONS OF THE ORCHARDS

As in most fruit sections, one finds all kinds of orchards in Fremont County, from the best to the worst. Failure of a crop or crops causes the owner to neglect the trees and when there is a prospect of a good crop the trees are not in condition to produce a profitable crop and the owner is again disappointed. A high percentage of the orchards is neglected and unprofitable. Pruning,

spraying and fertilization are also neglected. Not a few orchards are cared for by tenants and in most instances tenant fruit-growing or fruit growing by proxy are unprofitable.

On the other hand there are a number of first-class, commercial orchards favorably located and cared for by first-class fruit growers. These orchards have been profitable and will continue to be so, so long as the orchards receive the proper attention.

A study of the table on varieties of fruit grown in the county shows that some fifty varieties are grown. To the non fruit grower this large list looks impressive and would indicate a highly developed industry. The contrary is true. For while there are several thousand varieties all told, only a dozen are, strictly speaking, commercial. Fremont County fruit growers were the pioneers in this industry and one would naturally expect the early orchards to contain a large number of varieties since these pioneers had no information about suitable varieties to guide them.

The newer plantings as a rule contain only commercial varieties adapted to the district.

The individual orchards are small and in many cases the owners do not depend entirely upon the orchards for a living.

For tables and fuller description see Bulletin No. 254.

PUEBLO COUNTY

Fruit growing in Pueblo county is confined to bench lands south of the Arkansas River. The land is more or. less broken up into ridges and terraces and affords excellent soil and air drainage. These terraces and broken lands merge into a level plain, the latter being unsuited for tree fruits. The district adapted to fruits is quite limited and practically all planted to trees. Most of the standard varieties can be grown successfully.

The fruit industry as a whole is prosperous. It is close to the city of Pueblo with its large consuming population, which affords an excellent market for all products.

Failures of crops do occur but no oftener than in other districts. The orchards are, in general, well cared for and indicate that fruit growing is and has been profitable. Small fruits and vegetables are also grown extensively enough to supply the large local demand.

Considerable interest in the fruit industry is taken by the county commissioners and a county horticulturist is employed to aid the growers in their problems As a result the orchards in Pueblo County are in better condition than in any other section of the district. There is very limited room for the expansion of the fruit industry, as most of the available land suited to fruits is already in orchards.

The most important problem for the grower is soil condition. Clean culture and sod should be substituted for alternate growing of cover crops, and clean culture, the cover crops to supply vegetable matter in which the soil is deficient.

The soil and temperature conditions are, on the whole, favorable for tree fruits. The season is long and most commercial varieties can be grown.

The survey records only the commercial plantings and on this account the number of trees is considerably below the true figure. Most farmers have a family orchard, though these orchards are poorly cared for and the fruit is of low quality. The survey also shows that there has been practically no new planting for the past ten years, and that there are fewer apple trees now than ten years ago.

Fruit growing is carried on more or less in connection with general farming, and, as is usually the case where this is practiced, the orchards are often neglected for the more urgent, or seemingly urgent, work of caring for the farm crops. Fruit growing is the work and business of a specialist. It requires considerable study and attention to details to make it profitable. The necessary operations in connection with the orchard cannot be postponed or delayed until a convenient time. They must be done at the right time and in the right way.

As a general rule the commercial orchards in Pueblo County are well cared for, but there is a lack of system in pruning and cultivation. The work is seemingly done whenever there is time that can be taken from the performance of other duties. In cases of total neglect, it is more profitable for the grower to remove the orchard and utilize the land for farm crops, leaving enough, however, for family use. An unproductive orchard is the poorest paying land on the farm, and the sooner it is removed, the better it is for the owner.

While the general farm orchards in the county are in a poor condition, it does not, as a rule, apply to the commercial orchards. There are few growers who take excellent care of their orchards, and who are making a success of fruit growing, and will continue to make a success regardless of the experience of their neighbors. Many of the neglected or seemingly neglected orchards can be restored to profitable production by proper pruning, cultivation and irrigation. It would pay the grower to have a clean up and to put the orchard in first-class condition.

As in many of our fruit-growing sections, there are too many varieties planted in the orchards. The survey records twenty-two named varieties and some unknown varieties. Many of these are not commercial and practically worthless so far as production is concerned. These poor or worthless varieties should be top

grafted to the profitable ones. While winter apples of the commercial kind can be grown, we believe that the summer and fall varieties would, on the whole, be more profitable. There is always a good market for early varieties, and these would not come in serious competition with sections that produce the winter fruits.

The apple constitutes the larger portion of the fruit trees grown in the county, followed by the sour cherries. The sour cherry industry gives greater promise in success in most instances than the apples. While the trees are short lived, yet they are capable of bearing annual crops and when properly cared for, will yield a greater return per acre than the apples.

Number of Orchards in Pueblo County

Avondale	3
Pueblo	25
Total	28

Number of Apple Trees in Each Orchard District

Avondale	10,527
Pueblo	10,505
Total	21,032

Number of Cherry Trees in Each Orchard District

Avondale	2550
Pueblo	645
Total	3195

Summary

No. of apple trees in Pueblo County	21,032
No. of cherry trees in Pueblo County	3,195
Grand Total	24,227

CROPS GROWN IN THE ORCHARDS OF PUEBLO COUNTY

District	Alfalfa	Berries	Clean	Corn	Sweet Clover
Avondale	2	..	1	..	..
Pueblo	18	1	4	1	1
Totals	20	1	5	1	1

GRAND TOTALS—PUEBLO COUNTY

Number of acres in fruit trees	245
Number of fruit trees of all kinds	24227
Number of orchards	28

Distribution of Trees by Age Class

Age 1-8 years	
Age 8-12 years	270
Age 12-40 years	23957

Condition of Orchards: Good, 0; Fair, 19; Poor, 9.

NUMBER AND VARIETIES OF APPLE TREES IN PUEBLO COUNTY

1.	Arkansas Black	13	
2.	Baldwin	25	
3.	Ben Davis	6650	
4.	Delicious	3010	
5.	Gano	3408	
6.	Iowa Blush	20	
7.	Jonathan	3885	
8.	Maiden Blush	5	
9.	Missouri	1382	
10.	Northwestern Greening	30	
11.	Oldenburg	167	
12.	Paragon	20	
13.	Ralls	210	
14.	Rambo	10	
15.	Red June	80	
16.	Romanite	50	
17.	Rome	30	
18.	Walbridge	120	
19.	Wealthy	820	
20.	Whitney (crab)	35	
21.	Winesap	1040	
22.	Yellow Transparent	22	
	Total	21,032	

NUMBER AND VARIETIES OF APPLE TREES GROWN IN PUEBLO COUNTY AND THEIR DISTRIBUTION

Variety	Avondale	Pueblo	Totals
1. Arkansas Black	13	....	13
2. Baldwin	....	25	25
3. Ben Davis	1,000	5,650	6,650
4. Delicious	3,010	....	3,010
5. Gano	3,070	338	3,408
6. Iowa Blush	....	20	20
7. Jonathan	3,200	685	3,885
8. Maiden Blush	....	5	5
9. Missouri	32	1,350	1,382
10. Northwestern Greening	....	30	30
11. Oldenburg	37	130	167
12. Paragon	....	20	20
13. Ralls	40	170	210
14. Rambo	....	10	10
15. Red June	5	75	80
16. Romanite	....	50	50
17. Rome	....	30	30
18. Walbridge	....	120	120
19. Wealthy	25	795	820
20. Whitney (crab)	10	25	35
21. Winesap	65	975	1,040
22. Yellow Transparent	20	2	22
Totals	10,527	10,505	21,032

DISTRIBUTION, ACREAGE, TREES, AGE, AND CONDITION

	Avondale	Pueblo	Summary
No. Acres	105½	113	218½
No. Trees	10,527	10,505	21,032
Age 1-8 years	.....	.....	.....
Age 8-12 years	.....	.....	.....
Age 12-40 years	10,527	10,505	21,032
Fair Condition	1	17	
Good Condition	.....	.....	
Poor Condition	2	6	

CONDITION OF ORCHARDS: Fair 18; Good 0; Poor 8.

NUMBER AND VARIETIES OF CHERRY TREES IN PUEBLO COUNTY

1. Early Richmond	345
2. English Morello	900
3. Montmorency	1,000
4. Wragg	950
Total	3,195

NUMBER AND VARIETIES OF CHERRY TREES GROWN IN PUEBLO COUNTY AND THEIR DISTRIBUTION

Variety	Avondale	Pueblo	Totals
1. Early Richmond	50	295	345
2. English Morello	900	...	900
3. Montmorency	800	200	1,000
4. Wragg	800	150	950
Totals	2,550	645	3,195

DISTRIBUTION, ACREAGE, TREES, AGE, AND CONDITION

	Avondale	Pueblo	Summary
No. Acres	20½	6	26½
No. Trees	2,550	645	3,195
Age 1-8 years	.....	.....	.....
Age 8-12 years	.....	270	270
Age 12-40 years	2,550	375	2,925
Fair Condition	2	1	
Good Condition	.....	.....	
Poor Condition	.....	3	

TABLE I—NUMBER OF FRUIT TREES IN EACH DISTRICT

District	Apples	Cherries	Dist. Tot.
Avondale	10,527	2,550	13,077
Pueblo	10,505	645	11,150
Entire County	21,032	3,195	24,227

TABLE II—NUMBER OF ACRES OF EACH FRUIT FOR EACH DISTRICT IN ENTIRE COUNTY

	Avondale	Pueblo	Entire Co.
Apples	105.5	113	218.5
Cherries	20.5	6	26.5
Totals, all fruits	126.0	119	245.0

TABLE II-a—NUMBER OF ACRES OF EACH FRUIT OF BEARING AGE FOR EACH DISTRICT

	Avondale	Pueblo.	Entire Co.
Apples	105.5	113.0	218.5
Cherries	20.5	3.5	24.0
Totals, all fruits	126.0	116.5	242.5

TABLE III—SIX PRINCIPAL VARIETIES OF APPLES SHOWING PERCENTAGES GROWN IN EACH DISTRICT AND IN ENTIRE COUNTY

Variety	Avondale	Pueblo	Entire Co.
1. Ben Davis	9.5	53.3	31.4
2. Jonathan	30.4	5.7	18.1
3. Gano	28.5	2.8	16.2
4. Delicious	28.4	.....	14.3
5. Missouri	0.3	12.3	6.2
6. Winesap	0.5	8.5	4.7
All others	2.4	17.4	9.1
Totals	100.0	100.0	100.0

TABLE IV—NUMBER OF APPLE TREES OF EACH DISTRICT AND OF ENTIRE COUNTY BY AGE CLASS

Age Class	Avondale	Pueblo	Entire Co.
1-8 years	.....	.....	.....
8-12 years	.....	.....	.....
12-40 years	10,527	10,505	21,032
Totals	10,527	10,505	21,032

CROWLEY COUNTY

Crowley County is situated on the north side of the Arkansas River, east of Pueblo. The fruit industry of this county is confined to a number of commercial orchards, principally around Olney Springs, and eastward. Outside of this small section there has been practically no planting and so far as the apple industry is concerned, the eastern half or the county is not adapted to this crop. The section around Olney Springs is more or less protected; the soil and climatic conditions are favorable.

The varieties grown are relatively few and are in most cases of the standard commercial varieties. Some weeding out or top-working would be beneficial, but on the whole the varieties are good.

Cultural methods are good. Up-to-date methods of cultivation and spraying are used, and the orchards do not show the neglect that we find in many other of our fruit districts. While there has been little planting during the last ten years, there are many localities where the planting should be extended with the prospect of success. The orchards vary in age from twelve to forty years. They are in relatively large acreage, and are in the hands of fruit growers who make it a business to grow fruit; consequently, the orchards are in good condition, and the profits derived from the orchards are also satisfactory.

The sour cherry industry has become important, especially around the town of Crowley, where there are several large cherry orchards. The soil around Crowley is a sandy loam and well suited for this fruit. The sour cherries seem to suffer less from late spring frost and for this reason there are few failures.

The future outlook for fruit growing is good, especially for sour cherries. Other tree fruits outside of the few favorable localities should not be planted for commercial purposes.

CROPS GROWN IN THE ORCHARDS--CROWLEY COUNTY

	Alfalfa.	Clean Cultivation.	Rye.
Crowley	2		1
Olney Springs	9	6	.
Totals.....	9	8	1

Number of Commercial Orchards in Crowley County:

Crowley	3
Olney Springs	15
Total.....	18

Number of Apple Trees in each Orchard District:

Crowley	800
Olney Springs	15,632
Total.....	16,432

Number of Cherry Trees in each Orchard District:

Crowley	14,706
Olney Springs	6,571
Total.....	21,277

Number of Plum Trees in each Orchard District:

Crowley	
Olney Springs	80
Total.....	80

SUMMARY

No. of Apples Trees in Crowley County	16,432
No. of Cherry Trees in Crowley County	21,277
No. of Plum Trees in Crowley County	80
Total Trees	37,789

NUMBER AND VARIETIES OF APPLE TREES IN CROWLEY COUNTY

1. Ben Davis	8705	10. Sheepnose	20
2. Gano	1192	11. Siberian Crab	25
3. Grindstone	40	12. Stayman Winesap	200
4. Huntsman	25	13. Wealthy	200
5. Jonathan	1910	14. Whitney (crab)	45
6. Missouri	1795	15. Winesap	1440
7. Oldenburg	25	16. Wolf River	10
8. Paragon	520	17. Yellow Transparent	180
9. Red Astrachan	100	Total	16,432

NUMBER AND VARIETIES OF APPLE TREES GROWN IN CROWLEY COUNTY AND THEIR DISTRIBUTION

Variety	Crowley	Olney Springs	Totals
1. Ben Davis	500	8,205	8,705
2. Gano	....	1,192	1,192
3. Grindstone	....	40	40
4. Huntsman	....	25	25
5. Jonathan	....	1,910	1,910
6. Missouri	90	1,705	1,795
7. Oldenburg	....	25	25
8. Paragon	....	520	520
9. Red Astrachan	....	100	100
10. Sheepnose	....	20	20
11. Siberian Crab	....	25	25
12. Stayman Winesap	200	....	200
13. Wealthy	....	200	200
14. Whitney (crab)	....	45	45
15. Winesap	....	1,440	1,440
16. Wolf River	10	....	10
17. Yellow Transparent	....	180	180
Totals	800	15,632	16,432

DISTRIBUTION, ACREAGE, TREES, AGE, AND CONDITION

	Crowley	Olney Springs	Summary
No. Acres	15	282.5	297.5
No. Trees	800	15,632	16,432
Age 1-8 years	....	75	75
Age 8-12 years	....	....	....
Age 12-40 years	800	15,557	....
Fair Condition	1	8	
Good Condition	....	5	
Poor Condition	....	....	

CONDITION OF ORCHARDS: Good Condition 5; Fair Condition 9; Poor Condition 0.

NUMBER AND VARIETIES OF CHERRY TREES IN CROWLEY COUNTY

1.	Early Richmond	745
2.	English Morello	15
3.	Montmorency	3733
4.	Wragg	16781
	Total	21,277

NUMBER AND VARIETIES OF CHERRY TREES GROWN IN CROWLEY COUNTY AND THEIR DISTRIBUTION

Variety	Crowley	Olney Springs	Totals
1. Early Richmond	....	748	748
2. English Morello	....	15	15
3. Montmorency	1,200	2,533	3,733
4. Wragg	13,506	3,275	16,781
Total	14,706	6,571	21,277

DISTRIBUTION, ACREAGE, TREES, AGE, AND CONDITION

	Crowley	Olney Springs	Summary
No. Acres	83	55	138
No. Trees	14,706	6,571	21,277
Age 1-8 years	13,626	5,045	18,671
Age 8-12 years	1,080	10	1,090
Age 12-40 years	....	1,516	1,516
Fair Condition	2	4	
Good Condition	1	4	
Poor Condition	....	....	

CONDITION OF ORCHARDS: Fair Condition 8; Good Condition 5; Poor Condition 0.

NUMBER AND VARIETIES OF PLUM TREES IN CROWLEY COUNTY

1.	Damson	40
2.	Wild Goose	40
	Total	80

NUMBER AND VARIETIES OF PLUM TREES GROWN IN CROWLEY COUNTY AND THEIR DISTRIBUTION

Variety	Crowley	Olney Springs	Totals
1. Damson	.....	40	40
2. Wild Goose	.....	40	40
Totals	.....	80	80

DISTRIBUTION, ACREAGE, TREES, AGE, AND CONDITION

	Crowley	Olney Springs	Summary
No. Acres	.....	1.5	1.5
No. Trees	.....	80	80
Age 1-8 years	.....	.....	.....
Age 8-12 years	.....	.....	.....
Age 12-40 years	.....	80	80
Fair Condition	.....	1	
Good Condition	.....	1	
Poor Condition	.....	.....	

CONDITION OF ORCHARDS: Fair 1; Good 1; Poor 0.

TABLE I—NUMBER OF FRUIT TREES IN EACH DISTRICT

District	Apples	Cherries	Plums	Dist. Totals
Crowley	800	14,706	.....	15,506
Olney Springs	15,632	6,571	80	22,283
Entire County	16,432	21,277	80	37,789

TABLE I-a—DISTRIBUTION (IN PERCENTAGES) OF TOTAL NUMBER OF TREES OF EACH FRUIT IN ENTIRE COUNTY BY DISTRICTS

District	Apples	Cherries	Plums	Entire Co.
Crowley	4.9	69.3	.....	41.1
Olney Springs	95.1	30.7	100.0	58.9
Entire County	100.0	100.0	100.0	100.0

TABLE I-b—SHOWING RATIO (IN PERCENTAGES) EACH FRUIT BEARS TO THE TOTAL NUMBER OF ALL FRUIT TREES FOR EACH DISTRICT

District	Apples	Cherries	Plums	Entire Co.
Crowley	5.1	94.9	...	100.0
Olney Springs	70.3	29.3	0.4	100.0
Entire County	43.5	56.2	0.3	100.0

TABLE II—NUMBER OF ACRES OF EACH FRUIT FOR EACH DISTRICT IN ENTIRE COUNTY

	Crowley	Olney Springs	Entire Co.
Apples	15.0	282.5	297.5
Cherries	83.0	55.0	138.0
Plums	.....	1.5	1.5
Totals, all fruits	98.0	339.0	437.0

TABLE II-a—NUMBER OF ACRES OF EACH FRUIT OF BEARING AGE FOR EACH DISTRICT

	Crowley	Olney Springs	Entire Co.
Apples	15.0	281.1	296.1
Cherries	6.4	23.1	29.5
Plums	.....	1.5	1.5
Totals, all fruits	21.4	305.7	327.1

TABLE III—SIX PRINCIPAL VARIETIES OF APPLES, SHOWING PERCENTAGES GROWN IN EACH DISTRICT AND IN ENTIRE COUNTY

Variety	Crowley	Olney Springs	Entire Co.
Ben Davis	62.5	52.5	53.0
Jonathan	.....	12.2	11.6
Missouri	11.2	10.9	10.4
Winesap	.....	8.9	8.5
Gano	.....	7.0	6.7
Paragon	.....	3.2	3.0
All Others (11 varieties)	26.3	5.3	6.8
Totals	100.0	100.0	100.0

GRAND TOTALS

Crowley County

Number of acres in fruit trees	437
Number of fruit trees of all kinds	37,789
Number of orchards	18

DISTRIBUTION OF TREES BY AGE CLASS

Age 1-8 years	18,746
Age 8-12 years	1,090
Age 12-40 years	17,953

OTERO COUNTY

Otero County is one of the important fruit-growing sections on the eastern slope of Colorado. Its importance is due to the foresight of men like Senator Crowley, who has done more for the fruit industry of this county than any other man. As in the case of Pueblo and Crowley Counties, the fruit-growing area is confined to the irrigated land adjacent to the Arkansas River. Wherever the land is rolling so as to produce good soil and air drainage, fruit trees, such as apples and sour cherries, can be grown successfully. The soil and climatic conditions are favorable for these fruits, which is attested by the luxuriant growth that these trees make.

The apple industry was naturally the first industry to attain any importance in this county, especially around Rocky Ford and Manzanola. Of later years the sour cherry industry has grown in importance, and is today more extensive and profitable, while apple orchards have been somewhat neglected.

Like the rest of the counties along the Arkansas River, Otero is subject to occasional spring frosts, which kill the blossoms. Yet the occurrence of these frosts is by no means serious, and crops are obtained as regularly as in most fruit-growing sections of the state. During the last few years, there has been a decided slump in the apple-growing industry, because of several failures of crops and the consequent neglect that usually follows such failures. This is especially true where growing is more or less closely associated with farming. There are few growers whose sole business is to grow fruit. Most of them do not rely upon the fruit crop for a livelihood. The development of other industries in the valley has also caused neglect of the orchards. Annual crops like melons and beets have been profitable and the farmers have paid more attention to these crops than to the orchards. This has resulted not only in a decided decline in the number of apple trees, but also in a general neglect of the orchards, and many of them are today not in condition to produce a profitable crop.

There is great need for missionary work in the county along fruit lines, such as pruning, spraying and cultural methods. Un-

less there is a revival, many of the present orchards will soon become useless.

The sour-cherry industry is perhaps more important and also more profitable than the apple. New orchards are being set out and the acreage in sour cherries shows a substantial increase. Many of these orchards are small and indicate a wide-spread interest in the fruit. On the whole, cherry orchards are better cared for than the apple orchards. The cherry trees have suffered greatly during the last few years from poor soil conditions, due to the presence of excessive nitre in the soil. Clean culture has been practiced universally and this has resulted in an accumulation of nitre. As a result of this accumulation a large number of trees have died, and a large number are dying. This condition can be prevented by the steady use of cover crops, which should be grown between the trees and plowed under. The plowing under of the green crops will check the nitrification process in the soil, and thus make the land again suitable for the cherry trees.

A survey of the cherry orchards makes it apparent that unless the growers practice the sowing and plowing under of green crops in the cherry orchards, this industry will not flourish, and may be entirely wiped out.

Number of Commercial Orchards in Otero County:

Manzanola	51
Rocky Ford	9
Total	60

Number of Apple Trees in Each Orchard District:

Manzanola	22,075
Rocky Ford	2,275
Total Trees	24,350

Number of Cherry Trees in Each Orchard District:

Manzanola	23,709
Rocky Ford	5,990
Total Trees	29,699

Number of Peach Trees in Each Orchard District:

Manzanola	105
Rocky Ford	
Total Trees	105

Number of Plum Trees in Each Orchard District:

Manzanola	306
Rocky Ford	
Total Trees	306

CROPS GROWN IN THE ORCHARDS

Otero County

	Clean Cultivation	Alfalfa	Truck	Oats	Orchard Grass
Manzanola	16	23	11	1	..
Rocky Ford	2	3	2	..	2
Totals	18	26	13	1	2

SUMMARY

No. of Apples Trees in Otero County	24,350
No. of Cherry Trees in Otero County	29,699
No. of Peach Trees in Otero County	105
No. of Plum Trees in Otero County	306
Grand Total	54,460

NUMBER AND VARIETIES OF APPLE TREES IN OTERO COUNTY

1.	Arkansas Black	300	19.	Paragon	870
2.	Banana	4	20.	Ralls	791
3.	Ben Davis	9623	21.	Rambo	15
4.	Black Twig	252	22.	Red Astrachan	60
5.	Chenango	6	23.	Red June	90
6.	Delicious	56	24.	Romanite	12
7.	Early Harvest	190	25.	Rome	15
8.	Fameuse	26	26.	Stayman Winesap	25
9.	Gano	1523	27.	Walbridge	18
10.	Grimes	10	28.	Wealthy	250
11.	Huntsman	6	29.	White Pearmain	15
12.	Jonathan	5475	30.	Winesap	2590
13.	King David	10	31.	Wolf River	22
14.	Maiden Blush	5	32.	Yellow Bellflower	10
15.	McIntosh	20	33.	Yellow Transparent	55
16.	Missouri	1751	34.	York Imperial	170
17.	Northwestern Greening	65			
18.	Oldenburg	20		Total	24,350

NUMBER AND VARIETIES OF APPLE TREES GROWN IN OTERO COUNTY AND THEIR DISTRIBUTION

Variety		Manzanola	Rocky Ford	Totals
1.	Arkansas Black	300	.....	300
2.	Banana	4	.....	4
3.	Ben Davis	8,243	1,380	9,623
4.	Black Twig	252	.....	252
5.	Chenango	....	6	6
6.	Delicious	46	10	56
7.	Early Harvest	190	.....	190
8.	Fameuse	26	.....	26
9.	Gano	1,523	.....	1,523
10.	Grimes	10	.....	10
11.	Huntsman	6	.....	6
12.	Jonathan	5,166	309	5,475
13.	King David	10	.....	10
14.	Maiden Blush	5	.....	5
15.	McIntosh	20	.....	20
16.	Missouri	1,736	15	1,751
17.	Northwestern Greening	65	.....	65
18.	Oldenburg	20	.....	20
19.	Paragon	870	.....	870
20.	Ralls	779	12	791
21.	Rambo	15	.....	15
22.	Red Astrachan	35	25	60
23.	Red June	90	.....	90
24.	Romanite	12	.....	12
25.	Rome	15	.....	15
26.	Stayman Winesap	25	.....	25
27.	Walbridge	....	18	18
28.	Wealthy	120	130	250
29.	White Pearmain	15	.....	15
30.	Winesap	2,237	553	2,590
31.	Wolf River	5	17	22
32.	Yellow Bellflower	10	.....	10
33.	Yellow Transparent	55	.....	55
34.	York Imperial	170	.....	170
	Totals	22,075	2,275	24,350

DISTRIBUTION, ACREAGE, TREES, AGE AND CONDITION

	Manzanola.	Rocky Ford.	Summary.
No. Acres	329.75	31	360.75
No. Trees	22,075	2,275	24,350
Age 1-8 years	1,600	.....	1,600
Age 8-12 years	140	.....	140
Age 12-40 years	20,335	2,275	22,610
Fair Condition	19	4	
Good Condition	12	.....	
Poor Condition	6	.....	

CONDITION OF ORCHARDS: Fair Condition 23; Good Condition 12; Poor Condition 6.

NUMBER AND VARIETIES OF CHERRY TREES IN OTERO COUNTY

1.	Dyehouse	15
2.	Early Richmond	5,503
3.	English Morello	915
4.	Montmorency	6,895
5.	Riga No. 108	300
6.	Sixteen-to-One	5
7.	Wragg	16,066
	Total Trees	29,699

NUMBER AND VARIETIES OF CHERRY TREES GROWN IN OTERO COUNTY AND THEIR DISTRIBUTION

	Variety	Manzanola.	Rocky Ford.	Totals.
1.	Dyehouse	15	.....	15
2.	Early Richmond	4,647	856	5,503
3.	English Morello	615	300	915
4.	Montmorency	5,145	1,750	6,895
5.	Riga No. 108	....	300	300
6.	Sixteen-to-One	5	.....	5
7.	Wragg	13,282	2,784	16,066
	Totals	23,709	5,990	29,699

DISTRIBUTION, ACREAGE, TREES, AGE AND CONDITION

	Manzanola.	Rocky Ford.	Summary.
No. Acres	176	36.5	212.5
No. Trees	23,709	5,990	29,699
Age 1-8 years	18,270	3,740	22,010
Age 8-12 years	4,514	2,250	6,764
Age 12-40 years	925	.....	925
Fair Condition	22	7	
Good Condition	13	.....	
Poor Condition	6	.....	

CONDITION OF ORCHARDS: Fair Condition 29; Good Condition 13; Poor Condition 6.

NUMBER AND VARIETIES OF PEACH TREES IN OTERO COUNTY*

1.	Champion	10
2.	Early Crawford	17
3.	Elberta	10
4.	Fitzgerald	3
5.	Indian	5
6.	Japan Dwarf	10
	Unknown	50
	Total	105

* All of the above varieties found in the Manzanola section.

DISTRIBUTION, ACREAGE, TREES, AGE AND CONDITION

	Manzanola.	Rocky Ford.	Summary.
No. Acres	0.75	.....	0.75
No. Trees	105	.....	105
Age 1-8 years	105	.....	105
Age 8-12 years	....	.....	.....
Age 12-40 years	....	.....	.....
Fair Condition	1	.....	
Good Condition	2	.....	
Poor Condition	....	.....	

CONDITION OF ORCHARDS: Fair Condiiton 1; Good Condition 2; Poor Condition 0.

NUMBER AND VARIETIES OF PLUM TREES IN OTERO COUNTY*

Damson	73
Italian Prune	60
Lombard	5
Reine Claude	60
Wild Goose	108
Total	306

* All of the above varieties found in the Manzanola section.

DISTRIBUTION, ACREAGE, TREES, AGE AND CONDITION

	Manzanola.	Rocky Ford.	Summary.
No. Acres	2.5	.....	2.5
No. Trees	306	.....	306
Age 1-8 years	175	.....	175
Age 8-12 years	31	.....	31
Age 12-40 years	100	.....	100
Fair Condition	3	.....	
Good Condition	3	.....	
Poor Condition	1	.....	

CONDITION OF ORCHARDS: Fair Condition 3; Good Condition 3; Poor Condition 1.

TABLE I—NUMBER OF FRUIT TREES IN EACH DISTRICT

District	Apples	Cherries	Peaches	Plums	Dist. Totals
Manzanola	22,075	23,709	105	306	46,195
Rocky Ford	2,275	5,990	.....	.....	8,265
Entire County	24,350	29,699	105	306	54,460

TABLE Ia—DISTRIBUTION (IN PERCENTAGES) OF TOTAL NUMBER OF TREES OF EACH FRUIT IN ENTIRE COUNTY BY DISTRICTS

District	Apples	Cherries	Peaches	Plums	Entire Co.
Manzanola	91.7	82.8	100.0	100.0	85.2
Rocky Ford	8.3	17.2	.....	.....	14.8
Entire County	100.0	100.0	100.0	100.0	100.0

TABLE I-b—SHOWING RATIO (IN PERCENTAGES) EACH FRUIT BEARS TO THE TOTAL NUMBER OF ALL FRUIT TREES FOR EACH DISTRICT

District	Apples	Cherries	Peaches	Plums	Entire Co.
Manzanola	47.7	51.4	0.2	0.7	100.0
Rocky Ford	26.8	73.2	.....	.....	100.0
Entire County	44.6	54.4	0.2	0.8	100.0

TABLE II—NUMBER OF ACRES OF EACH FRUIT FOR EACH DISTRICT IN ENTIRE COUNTY

	Manzanola.	Rocky Ford.	Entire Co.
Apples	329.75	31.0	360.75
Cherries	176.0	36.5	212.5
Peaches	0.75	.....	0.75
Plums	2.5	.....	2.5
Totals, all Fruits	509.00	67.5	576.50

TABLE II-a—NUMBER OF ACRES OF EACH FRUIT OF BEARING AGE FOR EACH DISTRICT

	Manzanola.	Rocky Ford.	Entire Co.
Apples	305.75	31.0	336.75
Cherries	141.0	24.5	165.5
Peaches	0.5	.....	0.5
Plums	1.0	.....	1.0
Totals, all Fruits	448.25	55.5	503.75

TABLE III—SIX PRINCIPAL VARIETIES OF APPLES, SHOWING PERCENTAGES GROWN IN EACH DISTRICT AND IN ENTIRE COUNTY

Variety	Manzanola.	Rocky Ford.	Entire Co.
Ben Davis	37.3	59.1	39.5
Jonathan	23.2	13.7	22.2
Winesap	10.5	16.1	10.0
Missouri	7.7	2.0	6.9
Gano	6.8	....	6.2
Paragon	3.6	.....	3.3
All others	10.9	9.1	11.9
Totals	100.0	100.0	100.0

TABLE IV—THREE PRINCIPAL VARIETIES OF CHERRIES, SHOWING PERCENTAGES GROWN IN EACH DISTRICT AND IN ENTIRE COUNTY

Variety	Manzanola.	Rocky Ford.	Entire Co.
Wragg	55.7	45.7	55.2
Montmorency	21.5	28.8	10.7
Early Richmond	19.4	13.5	17.3
All others	3.4	12.0	16.8
Totals	100.0	100.0	100.0

TABLE V—NUMBER OF APPLE TREES OF EACH DISTRICT AND OF ENTIRE COUNTY BY AGE CLASS

Age Class	Manzanola.	Rocky Ford.	Entire Co.
1-8 years	1,600	.....	1,600
8-12 years	140	.....	140
12-40 years	20,335	2,275	22,610
Totals	22,075	2,275	24,350

TABLE V-a—PERCENTAGE OF APPLE TREES OF EACH AGE CLASS PLANTED IN EACH DISTRICT

Age Class	Manzanola.	Rocky Ford.	Entire Co.
1-8 years	100.0	.....	100.0
8-12 years	100.0	.....	100.0
12-40 years	98.5	1.5	100.0

TABLE V-b—PERCENTAGE OF APPLE TREES OF EACH DISTRICT WITH RESPECT TO AGE

Age Class	Manzanola.	Rocky Ford.	Entire Co.
1-8 years	7.3	.....	6.6
8-12 years	0.5	.....	0.4
12-40 years	92.2	100.0	93.0
Totals	100.0	100.0	100.0

TABLE VI—PERCENTAGE OF CHERRY TREES OF EACH DISTRICT WITH RESPECT TO AGE

Age Class	Manzanola.	Rocky Ford.	Entire Co.
1-8 years	78.3	62.7	75.8
8-12 years	17.4	37.3	20.7
12-40 years	4.3	.....	3.5
Totals	100.0	100.0	100.0

GRAND TOTALS

Otero County

Number of Acres in fruit trees	576.5
Number of fruit trees of all kinds	54,460.
Number of orchards	60.
Distribution of Trees by Age Class—	
Age 1-8 years	23,890
Age 8-12 years	6,935
Age 12-40 years	23,635
Condition of Orchards—	
Fair	35
Good	17
Poor	8
Total	60