

RECORDS AND

BOX  
50

LAND MANAGEMENT SURVEY - UNIT NO. 17

AGRONOMY DIVISION

Land Management Unit No. 17 occupies parts of Navajo and Apache Counties in Arizona, and is located in the south central part of the Navajo Indian Reservation. It lies approximately between the 35° and 36° parallels of latitude and the 109° 15' and 110° 00' meridians of longitude.

About .4 of one percent of the 1,144,122 acres in this Unit is farmed and can be increased until it reaches about .55 of one percent.

There are 1.4 acres of land being farmed per capita in this unit.

(Figures on population compiled by the Sociological Division.)

Physiography

The district is a part of the Colorado Plateau Province, a region of folded and fluted sedimentary rocks, transversed by innumerable canyons. The southwest part of the unit consists of rounded mounds and mesas, walls of shale, and is a part of the Painted Desert formation. The central part of the area consists of old valley fillings and rock outcroppings; while the northern part of the unit consists of the Defiance Plateau, a region of shallow soils, undulating topography, and rugged rock canyons. The general elevation of the area stands at an altitude of about 6,500 feet; the variation above and below is about 2,800 feet. The lowest elevation is about 5,200 feet and is found at the Painted Desert region; the highest general elevation is 8,000 feet in the vicinity of Fluted Rock.

The topographic features of the area show the influence of aridity. There are no permanent streams in this unit, with the exception of a few places where accumulated flow of several springs runs a short distance until it finally disappears in the sandy bed of the wash.

Drainage

With the exception of a limited area northwest of Ganado which drains into the Chinlee, the entire unit lies within the Little Colorado River watershed. The Pueblo Colorado Wash, which heads in the vicinity of Fluted Rock and the Leroux Wash, which heads on the Defiance Plateau south of the Ganado-St. Michaels Road, are the main

drainages. Steamboat, Wide Ruins, Pine Springs, and Sabito Washes are of secondary importance. Agricultural concentrations are located along these drainages and their tributaries.

#### Climate

The average precipitation varies from 9.5 inches in the lower part of the unit to above 14 inches at Fluted Rock. (Average at Ft. Defiance is 13.68 inches.) Forty-three percent of the annual precipitation falls during July, August and the first part of September.

The growing season varies from 120 days in the higher elevations to 142 days in the lower part of the area. The estimated annual temperature is 48.4° with a mean average daily fluctuation of 32°. The prevailing winds are from the southwest.

#### Native Vegetation

The vegetative formations of the area vary from the upper Sonora through the Transition. In the lower part of the area you find the climax vegetation, being drouth-resistant grasses and shrubs. This changes as you go higher into the blue grama - sage - pinon associations forming the climax, and finally in the higher area you find the ponderosa pine and mountain mühlenbergia association forming the climax vegetation.

#### Population

There are approximately 3,587 people grouped in 512 consumption groups resident in Unit No. 17. There are several general areas of population concentrations which are located in the vicinity of agricultural lands. These may be divided into a southeastern section, including Klagech, Wide Ruins and Pine Springs; a western section, composed of Steamboat; a large concentration, including Kin Li Chee, Cross Canyon, and the northeast corner of the unit; a north central portion, including Ganado and Cornfields; and a south central portion, including Greasewood and Sunrise Mesa.

The inhabitants gain their livelihood from the raising of livestock, farming, and wage work. The seasonal shifts of population are based on their economic activity with livestock or agriculture, and are generally confined to regions contiguous to agricultural land.

### Erosion and Soil

Wind and water erosion are serious problems in this unit. On the Ganado Irrigation Project both sheet and gully erosion are serious problems, while on most of the flood-irrigated and rainfall farms below the woodland association wind erosion is the main problem, sheet and gully erosion being secondary in importance.

The soil on the farms varies from heavy clay to sand, but the average for the unit is fine, sandy loam.

There are traces of alkali salts present over a large part of the area, but not in sufficiently large concentrations to be harmful except at Ain Li Chee, where the concentration of both black and white alkali is sufficient to be toxic to agricultural plants.

Farming practices range from primitive to modern. Plows are common and, in the hay-growing sections, mowers are being used. Corn is planted by hand, usually with a stick or hoe. Small grains are planted by hand; no use is made of the grain drill. This primitive method of planting corn on the small alluvial fans cannot be criticized. The per-acre cost of subjugation is too high; cultivation is not absolutely necessary; and the fan is not permanent. The hoe and horse-drawn blade are used for weeding and cultivation. Corn is gathered by hand, husked, and placed out in the open to dry before being shelled and placed in small underground bins or being sold to the trader.

### Agricultural Plants Used

Corn is the principal crop grown in this unit, representing seventy-seven percent of the land now under cultivation. Alfalfa rates second, with the acreage planted in oats almost as large. With the exception of four percent, the remainder of the farmland is planted to melons, beans, potatoes, and some vegetables.

Corn	77%
Alfalfa	7%
Oats	6%
Melons	5%
Beans	2%
Potatoes	1%
Idle	4%

Four percent of the total land which has been farmed within the last few years was idle this summer.

Agricultural Land Classification

There is at present 3,956 acres of farmed land in this unit and, by the diversion of flood water and the economical use of irrigation water, this can be increased by 1,750 acres, making a total of 5,706 acres that can be farmed.

The total acreage was divided into three classes:

1. Irrigated land, that land which has permanent water available.
2. Flood irrigated land, or that land that is being irrigated from intermittent streams.
3. Rainfall farms, or those that depend upon direct rainfall.

Classification of Agricultural Land

	Present Farmed Land	Potential Land	Total
Irrigated	341	500	841
Flood Irrigated	3100	1170	4270
Dry	515	80	595
Total	3956	1750	5706

There were 560 tracts located.

Agricultural Concentrations

The areas of agricultural concentrations will fall under two main headings, those that have permanent water available and those dependent upon water from intermittent streams.

1. Irrigation

The Ganado Irrigation Project which is located in the vicinity of Ganado comprises 341 acres of farmed land and 500 acres of potential land.

Alfalfa is the principal crop grown, corn ranking second, and oats third. The average estimated yield for alfalfa is two and one-fourth tons per acre, while the estimated yields for corn and oats were not above the average for the unit. The growing of vegetables could be increased considerably.

The present irrigation system is not satisfactory. The ditches are not large enough, and in many places the laterals are on too much grade, which has resulted in the cutting of deep gullies. It is impossible to get water on the farms from ditches several feet below the lower level of the land. Therefore, re-running of many of the ditches is necessary. Subjugation of the land should not be started until definite locations of the main ditches and laterals have been made. Gates should be installed at convenient places, so stabilization of ditch banks will be accomplished as soon as possible.

Flood waters from the badlands along the side of the project are causing considerable damage to the present ditches and agricultural land. Erosion control work should be started immediately in these areas and also in the potential land (see base map). Erosion control should render this land more easily subjugated as the necessity and water supply has been proven.

Heavy soil and high concentrations of alkali were found in the upper part of the area, while below the Ganado Mission the soil is lighter and no high concentrations of alkali were found.

The figures used in this survey do not include the land owned by Hubble and the Ganado Mission.

## 2. Flood Irrigation

The most productive of the flood irrigated areas is found at Klagetoh. The soil is friable and well adapted to agriculture. There is water available for part of this area at the present time but, before the water is turned into the ditches, proper subjugation of the land is necessary.

The concentrated areas at Cornfields, Greasewood, and Satan Butte are very much alike. Corn is the main crop grown. A partial diversion from the main drainage is necessary in order to irrigate the land. The water in these washes carries considerable silt and only sufficient water should be turned on the land to properly irrigate it.

The concentration at Wide Ruins is the least productive of the four areas. The problem here is not one of available agricultural land, but one of available water. Definite recommendations cannot be made until further

studies have been completed. These studies will include storage capacity, costs, and available water. Wind erosion is a serious problem; however, it can be checked by using the lister planter instead of the plow. It has also been recommended that wind breaks be planted in this area.

Low crop yields were found at Kin Li Chee where the soil is heavy and high in alkali salts. The thirty acres on the northwest side of the wash are a heavy clay, with poor drainage and good chances for a higher accumulation of salts if proper irrigation methods are not practiced. With the above points in mind, it was believed best to subjugate the forty-five acres on the southeast side of the wash. The soil here is lighter in texture and, if drains are built and the proper use of the water is practiced, this part of the Kin Li Chee area can be profitably farmed.

There are many small concentrations scattered over the unit; but the farms in the concentrated areas, in most cases, will be subjugated as individual farms and not as one big project.

#### Method of Location

The farms were given the same number on this survey that they were given by the Agricultural Survey, which was conducted during the summer of 1935. The Water Spreading Projects were given the next consecutive numbers, and any new farms we located were numbered consecutively from where the Water Spreading Survey stopped. If there were one hundred farms numbered on a mosaic and five water-spreading projects, any new farms we found would be numbered consecutively, starting with No. 106. All members of the survey group helped locate farms which were not previously numbered by the various survey parties who worked this unit.

Present farm land is represented on the map by Green color; potential land by Yellow; and potential meadow land by Orange. Revegetation possibilities are shown in Blue, and water-spreading possibilities are indicated by cross-hatching.

#### Yields

No actual measurements of crop production were made in this unit. All estimates were ocular and should not be used as definite material.

	<u>Present Average Production</u>	<u>Expected Average Production</u>
Corn	13 bushels	20 bushels
Alfalfa	4000 pounds	6000 pounds
Oats	12 bushels	20 bushels
Beans	150 pounds	300 pounds
Potatoes	4000 pounds	7000 pounds

The increased yields can be accomplished by:

1. Subjugation of the present farm land where recommended. This will make proper farming practices possible.
2. Proper preparation of seed bed and cultivation practices.
3. Field selection of seed and the planting of adaptable varieties.
4. The introduction and correct use of simple farm machinery.
5. Crop rotation and strip cropping where wind erosion is serious.
6. Fall plowing to reduce damage being done by cutworms.

(For information concerning crops grown and yields on individual farms, see Agronomy Study Sheets.)

#### Suggested Crops

The same crops cannot be recommended for the whole unit, so it has been divided into two parts--eastern or the Defiance Plateau, and western or the lower country, most of which has longer growing seasons. The suggested crops are:

##### 1. Eastern

Oats, potatoes, corn (in the lower part of this division), melons, beans, various vegetables, alfalfa, fall wheat, barley, and squash.

##### 2. Western

Corn, beans, melons, sudan grass, grain sorghums, alfalfa, turnips, and squash.

There is no distinct boundary between where these various crops can be grown and an over-lapping is to be expected.

Cost of Development

The cost of agricultural development involving bordering, leveling, or terracing, as the case may be, on the farm land is approximately \$78,900.00. The following table was used as a guide in making estimates on the cost of subjugation:

TABLE FOR CALCULATING COST OF SUBJUGATION

Slope	Leveling Only	Leveling and Bordering	
		Flood	Irrigated
Less than 1%	0 to 6	8 to 12	8 to 10
1%	6 to 10	14 to 20	14 to 18
2%		20 to 30	18 to 25
3%		30 to 45	25 to 40
4%		40 to 60	35 to 50
5%		50 to 75	40 to 70

See agronomy study sheets for cost and nature of work to be done on individual farms.

The cost of subjugating the different classes of land is shown in the following table.

COST OF SUBJUGATION

Class of Land	Acres	Average Cost Per Acre	Total
Present irrigated land	341	\$19.33	\$ 6,609.00
Potential irrigated land	500	20.00	10,000.00
Present flood irrigated land	3,100	13.90	43,083.00
Potential flood irrigated land	1,170	16.45	19,246.00
<b>Total</b>	<b>5,111</b>	<b>\$15.44</b>	<b>\$78,938.00</b>

TABLE SHOWING THE POPULATION, ACRES, AND PERCENTAGES OF THE DIFFERENT CROPS GROWN IN THE FIVE DIVISIONS OF THE UNIT AS DIVIDED BY THE SOCIAL-ECONOMIC DIVISION

	Population	% of Total	Acres and	Corn	Oats	Alfalfa	Melons	Beans	Potatoes	Idle	Truck
Kin Li Chee and Cross Canyon	939	1094	27.6%	704	187	107	20	16	12	38	—
"	26.2%	27.6%	64.4	17.1	9.8	2.7	1.5	1.0	3.5	—	—
Cornfields and Ganado	619	935	23.6%	626	53	162	16	4	70	4	—
"	17.3%	23.6%	66.9	5.7	17.3	1.7	.5	—	7.5	4	—
Klagetoh-Wide Ruins and Pine Springs	1131	831	21.0%	830	15	—	47	10	6	33	—
"	31.5%	21.0%	83.0	1.8	—	5.7	4.8	.7	4.0	—	—
Steamboat	472	642	16.3%	601	—	—	16	5	20	—	—
"	13.3%	16.3%	93.6	—	—	2.5	.8	—	3.1	—	—
Groesewood	420	454	11.5%	445	—	—	7.5	—	2	—	—
"	11.7%	11.5%	98	—	—	1.5	—	.5	—	—	—

WR 5667

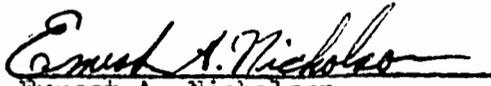
Summary

1. Land Management Unit No. 17 is located in the south central part of the Navajo Indian Reservation.
2. There are 1.4 acres of land being farmed per capita in this unit.
3. Wind and water erosion are serious problems in this unit.
4. The soil on the farms averages a fine, sandy loam.
5. 77% of the farmed land is planted in corn.
6. There are 5,706 acres of land that can be farmed in this unit.
  - a. Potential land, 1,750 acres
  - b. Farmed land, 3,956 acres
7. Cost of subjugating the land is \$78,938.00
8. The present production can be increased by:
  - a. Improving farming practices
  - b. Expansion of present farm land.
9. A wider range of crops should be grown.
10. The use of simple farm machinery should be encouraged.

Approved:

Submitted:

J. C. Wood  
Chief Agronomist.

  
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DEFINITIONS OF TERMS USED IN

AGRONOMY SURVEY BLANKS

Tract No.

Each tract or farm is numbered, beginning with one on each quadrangle. The number in the notes corresponds to a number on the map and a number placed on each tract. The study will use these numbers as permanent in reference to location of a farm under consideration.

Acres

Number of acres of tract as estimated by the agronomist on the survey.

Topography

The surface conditions of the tract, expressed in the following terms--slope, rough, even, irregular, hummocky, rolling.

Soil

Soils texture as defined by soils man.

C = clay, S = sand, L = loam, Li = light, F = fine.

The use of the symbols thus:  $\frac{FSL}{li-o}$  indicates a fine sandy loam over light clay.

Erosion

The extent of erosion: gully or sheet caused by wind or water.

Classification: slight, moderate, or severe.

Water

Water available for crop production. Classification: Doubtful, sufficient, excess.

Expansion

The possibilities of expanding the present farmed land to take in additional adjacent land. Listed as the acreage of potential land.

Present Crop

The crop or crops grown on the tract and acreage of each if more than one.

Suggested Crop

Crops which the agronomist suggests growing on the tract.

Yield

Estimate of yield for crops grown on tract as compared to other yields within unit.

Treatment

Recommended soil and water conservation practices, such as borders, dikes, terraces, and furrows. (Details of recommended treatment will be found on the engineer's notes on each farm.)

Cost per Acre

Estimated cost per acre for doing recommended work for each tract. (Estimated by engineer and agronomist.)

Class

The class of land as defined by the legend of land classification.

Remarks

Includes type of land; irrigated, flood irrigated, or dry farming, and any features noticeable to the agronomist. Where more space is needed, remarks are continued on the back of the survey sheet.

IRRIGATED LAND

Existing Projects

A - Grade

1. Will be confined to the following soil textures; fine sand, very fine sand, fine sandy loam, and loam.
2. Must have adequate water supply for growing any crop.

B - Grade

1. Will be confined to soils with silt loam and clay loam textures, in addition to soil textures included in Grade A land.
2. Must have adequate water for production of two cuttings of alfalfa.

C - Grade

Not recommended for agricultural purposes.

1. Slope too steep or irregular.
2. Presence of over .4% alkali.
3. Excessive erosion.
4. Lack of available water.
5. Deficient drainage.

Note: The amount of white alkali will not exceed .4% of any irrigable land. Over .05% black alkali automatically excludes any land from project. Coarse sand, stony land, and shallow soil will be considered as non-irrigable land.

DRY FARMING

A - Grade

1. Will be confined to soils with fine sand, very fine sand, and fine sandy loam textures, when the slope does not exceed 5% and up to soils with loam and silt loam textures, when the slope does not exceed 2%.
2. Adequate seasonal rainfall for the growth of beans and corn.

B - Grade

1. Will include any dry farms which are not classed as A - Grade, and which would not be recommended to take out of production because of excessive erosion.

IRRIGATED LAND (Available water supply continuous or nearly so)

Proposed Areas (Under consideration present)

A - Grade

1. Will be confined to soils with fine sand, very fine sand, fine sandy loam, and loam textures when slope does not exceed 5%, and up to soils with silt loam and clay loam textures when slope is not more than 3%.
2. Must have adequate water supply.
3. Must be easily put under ditch.
4. No leveling allowed for this class.

B - Grade

1. Will be confined to silt loam and clay loam soils.
2. An uncertain water supply would justify placing soils of fine sand, very fine sand, fine sandy loam and loam textures in this grade.
3. A slight amount of leveling is permissible.

C - Grade

Not recommended for agricultural purposes.

1. Slope too steep or irregular.
2. Presence of over .4% alkali.
3. Excessive erosion.
4. Lack of available water.
5. Deficient drainage.

POTENTIAL LAND

Grade A and B

Specifications for grades A and B under this heading are the same as for flood irrigated land.

Grade C

1. Will include only soils with loam, silt loam, and clay loam textures.
2. Area must be large enough to use probable water supply or such as to economically justify control of excess water.
3. Slope must not exceed 3%, and preferably not exceed 2%.

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					Tract No.
4	3	2	1.1	1.	
15	8	17	7	2	Acres
					Topography
1%	1%	1%	1%	1.5%	
					Soil
S.C.L	S.L.	F.C.L.	F.C.L.	F.C.L.	
No	No	No	No	No	Alkali
S. S. & Wind Erosion	S. S. & Wind Erosion	L. Sheet & Gulley	S. Sheet	S. Sheet	Erosion
		Sufficient if Controlled	Sufficient if Controlled	Sufficient if Controlled	Water
					Expansion
1	1	8	7	4	
Corn 15	Corn 8	Corn 17	--	Corn 2	Present Crops
		Corn, Pumpkins	Corn, Beans, Pumpkins, Potatoes	Corn	Suggested Crops
Corn 12	Corn 12	Corn 12 bu.	--	Corn 8 bu.	Yield
C. Border and Leveling	Bordering & Protection from Arroya	Bordering or Contour Furrowing	Border and Level	Border	Treatment
8.00	8.00	8.00	8.00	8.00	Cost Per Acre
X	X	X	X	X	Class A B C G
Flood Irrigated	Flood Irrigated	Flood Irrigated. Spring run off.	Flood Irrigation. Spring Run-off.	Flood Irrigated	Remarks

AGRONOMY DIVISION

LAND MANAGEMENT STUDY

QUAD. 26

DISTRICT 17

WR 5676

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9	8	7	6	5	Tract No.
4	1	5	3	11	Acres
1%	7%	1%	1%	1%	Topography
F.C.L	S. Loam	F.C.L.	Fr. C.L.	S.L	Soil
No	No	No	No	No	Alkali
S. Sheet	S. S. M. gully	S. Sheet & Gully	S. Sheet	S. Sheet	Erosion
Sufficient if Controlled		Sufficient if Controlled			Water
4	No	No	No	20 Subject to Engineer	Expansion
Corn 4	Corn 1	Corn 5	Beans Corn 1/2	Corn 11	Present Crops
Corn, Oats, Pumpkins		Corn Beans	Corn Beans	Corn Beans	Suggested Crops
Corn 12	Corn 12	Corn 10	Beans 200# Corn 12 bu.	Corn 12	Yield
Border	Contour Bordering & Leveling	Bordering or Contour Furrowing	C. Border & Leveling	C. Border & Leveling	Treatment
8.00	60.00	8.00	8.00	8.00	Cost Per Acre
X	X	X	X	X	Class A B C G
Flood Irrigated Spring run-off. 4 Tracts.	Flood Irrigated	Flood Irrigated 2 Tracts	Flood Irrigation	Flood Irrigation	Remarks

AGRONOMY DIVISION

LAND MANAGEMENT STUDY

QUAD. 26

DISTRICT

17

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11.1	11	10	9.2	9.1	Tract No.
5	10	8	2	5	Acres
1.5%	15%	1%	1%	1%	Topography
F.C.L.	F.C.L.	F.C.L.	F.C.L.	F.C.L. to S.L.	Soil
No	No	No	No	No	Alkali
S. Sheet	S. Sheet	S. Sheet & gully	S. Sheet	S. Sheet	Erosion
Fair - Sufficient	Fair - Sufficient	Sufficient if Controlled	Sufficient if Controlled	Sufficient if Controlled	Water
No	No	20	1	6	Expansion
Corn 3	Corn 10	Corn 8	Corn 2	Corn 5	Present Crops
Corn Pumpkins	Corn Pumpkins	Corn, Pumpkins	Corn, Pumpkins	Corn, Oats, Pumpkins.	Suggested Crops
Corn 12	Corn 12	Corn 10	Corn 8 bu.	Corn 10	Yield
Contour Border & Level	Contour Border & Level	Bordering or Contour Furrowing	Border	Border	Treatment
10.00	10.00	8.00	8.00	8.00	Cost Per Acre
X	X	X	X	X	Class A B C G
Flood Irrigated	Flood Irrigated	Flood Irrigated Spring run-off. Whorled Milkweed Present.	Flood Irrigated Spring run-off. This farm is bordered on one end	Flood Irrigated Spring run-off. 3 Tracks	Remarks

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LAND MANAGEMENT STUDY

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15	13	12	11.3	11.2	Tract No.
1	5	2	1/2	3	Acres
1.5%	2.5%	1%	1.5%	1.5%	Topography
F.C.L.	F.S.C.L.	F.C.L.	F.S.L.	F.C.L.	Soil
No	No	No	No	No	Alkali
Mod. Sheet & gully	S. Sheet	S. Sheet	S. Sheet	S. Sheet	Erosion
Sufficient if Controlled	Sufficient if Controlled	Fair	Fair	Sufficient	Water
No	No	No	No	No	Expansion
Corn 1	Corn 5	Corn 2	Corn 1/2	Corn 3	Present Crops
Corn Oats Pumpkins	Corn	Corn	Corn Beans	Corn Pumpkins	Suggested Crops
Corn 12	Corn 12 bu.	Corn 8 bu.	Corn 10	Corn 10	Yield
Bordering	Terrace	Contour Border & Leveling	Border (Contour) & Leveling	Contour Border & Level	Treatment
9.00	20.00	40.00	10.00	10.00	Cost Per Acre
	X		X		Class A B C G
X		X		X	
Flood Irrigated Head Erosion Should be Controlled	Flood Irrigated	Flood Irrigated	Flood Irrigated Not Planted	Flood Irrigated	Remarks

AGRONOMY DIVISION

LAND MANAGEMENT STUDY

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DISTRICT

17

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	26.1	26	27 South Side of Wash	27	26	Tract No.
	1	5	2	4	3	Acres
	1%	1%	D = 2% S = 3% (regular)	O = 1.5% S = 1.1%	2.5%	Topography
	F.C.L.	F.C.L.	F.S.L.	Fr. Clay	F.C.L.	Soil
	No	No	No	No	No	Alkali
	S.Sheet	S.Sheet	S.Sheet	S.Sheet	Mod. Sheet & Gully	Erosion
	Fair if Controlled	Fair if Controlled			Sufficient if Controlled	Water
	No	No	No	Heavy Soil	No	Expansion
	Corn 1	Corn 2 Oats 3	Corn 2	Corn 4	Corn ?	Present Crops
	Corn Oats	Corn Oats			Corn Oats Pumpkins	Suggested Crops
	Corn 12	Corn 10 Oats 12	Corn 10	Corn 10	Corn 12	Yield
	Contour Bordering	Contour Bordering	Leveling & Contour Border	Contour Bordering Spread Water from Gully	Bordering or Contour Furrowing	Treatment
	8.00	8.00	30.00	14.00	9.00	Cost Per Acre
	X	X	X	X	X	Class A B C G
	Flood Irrigated	Flood Irrigated	Flood Irrigated	Flood Irrigated. Side runoff North side of Wash.	Flood Irrigated	Remarks

AGRONOMY DIVISION

LAND MANAGEMENT STUDY

QUAD. 26

DISTRICT 17

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29.01	29	28	27	26.2	Tract No.
2	8	1	3	1	Acres
8-10 Excessive	3%	1%	3% slope	1.5%	Topography
Clay Loam	Clay Loam	Sandy Loam	Sandy Clay Loam	F.C.L.	Soil
None	None	None	No	No	Alkali
Moderate Sheet and Gully	Slight Sheet	Slight Sheet	Slight Sheet	S. Sheet	Erosion
Sufficient	Sufficient	Sufficient	Sufficient	Fair if Controlled	Water
None	None	1 Acre	1	No	Expansion
Alfalfa 1 Yellow Clover 1	Alfalfa } 8 Oats }	Corn 1	Corn 1 Alfalfa 1 Oats 1	New Farm	Present Crops
None	Alfalfa Oats Potatoes	Corn Wheat Oats	Alfalfa Oats Potatoes	Corn Oats	Suggested Crops
Alfalfa } 1/2 Clover }	Alfalfa } 1/2 Oats }	Corn 15	Corn 15 Alfalfa 4 Oats 10		Yield
None	Contour Bordering & Leveling	Bordering & Leveling	Two Diversions. Contour Border & Level	Contour Bordering & Leveling	Treatment
30.00	30.00	40.00	30.00	12.00	Cost Per Acre
	X	X	X	X	Class A B C G
X					
Flood Irrigated Spring run-off. Take out of cultivation.	Flood Irrigated Spring run-off. Alfalfa & Oats mixed.	Flood Irrigated-Spring Run-off.	Flood Irrigated, Spring Runoff. 5 Tracks.	Flood Irrigated	Remarks

AGRONOMY DIVISION

LAND MANAGEMENT STUDY

QUAD.

26

SECTION

27

WR 5681

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AGRONOMY DIVISION

LAND MANAGEMENT STUDY

QUAD. 26 DISTRICT 17

2895 BR

Tract No.	29.1	29.05	29.04	29.03	29.02	Tract No.
Acres	3	2	1	5	3	
Topography	2%	2%	1.5%	6%	2%	
Soil	Sandy Clay Loam	Friable Clay Loam	Clay Loam	Clay Loam	Clay Loam	
Alkali	None	None	None	None	None	
Erosion	Slight Sheet & Slight Gully	Slight Sheet	Slight Sheet	Slight Sheet & Gully	Slight Sheet	
Water	Sufficient	Sufficient	Sufficient	Sufficient	Sufficient	
Expansion	None	None	None	None	None	
Present Crops	Alfalfa 1 Oats 2	Corn 2	None	Alfalfa 5	Alfalfa 3	
Suggested Crops	Alfalfa Oats Potatoes	Corn Oats Wheat	Oats Wheat Corn	Alfalfa Corn Oats	Alfalfa Oats	
Yield	Alfalfa $\frac{1}{4}$ Oats 15	Corn 15 bu.	—	Alfalfa $\frac{1}{2}$	Alfalfa $\frac{1}{2}$	
Treatment	Contour Bordering & Leveling	Bordering	Bordering	Bordering or Contour Furrowing Terrace later.	Bordering & Leveling	
Cost Per Acre	20.00	20.00	18.00	50.00	20.00	
Class	A	X			X	
	B	X		X		
	C					
	G					
Remarks	Flood Irrigated, Spring runoff. 150x3 ft. to plant trees.	Flood Irrigated. Spring runoff.	This farm has been abandoned for several years but may be farmed.	Flood Irrigated Spring runoff. Terracing would be recommended but it is planted in alfalfa.	Flood Irrigated Spring runoff.	

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29.6	29.5	29.4	29.3	29.2	Tract No.
2	2	4	5	5	Acres
2%	2%	1%	slope 1% " 1.5%	1.5%	Topography
Clay Loam	Sandy Clay Loam	Clay Loam	Clay Loam Sandy Clay Loam	Clay Loam Sandy Clay Loam	Soil
None	None	None	None	None	Alkali
S. Sheet & Deep Gully eating into farm.	S. Sheet	Slight Sheet	Slight Sheet & Gully	Slight Sheet	Erosion
Sufficient	Sufficient	Sufficient	Sufficient	Sufficient	Water
None	None	None	None	None	Expansion
Alfalfa 2	Corn Alfalfa } 1/2 Oats 1	Corn 2 Alfalfa 1 Oats 1	Corn 5	Corn	Present Crops
Corn, Oats Wheat	(Same)	Corn Oats Potatoes	Corn Oats Alfalfa & Potatoes	Corn Oats Alfalfa	Suggested Crops
Alfalfa 1/2	Corn 15 Oats 15 Alfalfa 1/4	Corn 15 Alfalfa 1/4 Oats 10 bu.	Corn 15	Corn 15	Yield
Bordering & Leveling	Bordering & Leveling	Bordering	Contour Bordering & Leveling	Contour Bordering & Leveling	Treatment
30.00	20.00	8.00	25.00	10.00	Cost Per Acre
X	X	X	X	X	Class A B C G
	X	X	X		
Flood Irrigated Spring run-off	Flood Irrigated Spring run-off.	Flood Irrigated Spring run-off.	Flood Irrigated Spring run-off.	Flood Irrigated Spring run-off. John Francis	Remarks

AGRONOMY DIVISION

LAND MANAGEMENT STUDY

QUAD. 26

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31	30	29.9	29.8	29.7	Tract No.
1	2	$\frac{1}{2}$	5	$\frac{1}{2}$	Acres
7%	5% rolling	3%	2 - 5 Very irregular.	1%	Topography
Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Soil
None	None	None	None	None	Alkali
Slight erosion	Slight Sheet & Gully	Slight Sheet & Gully	Slight Sheet Severe Gully	Slight Sheet & Gully	Erosion
Sufficient	Sufficient	Sufficient	Sufficient	Sufficient	Water
None	None	$\frac{1}{2}$	None	None	Expansion
Oats 1	Corn 2	Corn $\frac{1}{2}$	Alfalfa 3 Oats 2	Corn $\frac{1}{2}$	Present Crops
	Corn, Wheat, Oats	Corn Oats Wheat	Alfalfa Oats	Oats Wheat	Suggested Crops
Oats 5 bu.	Corn 15	Corn 10	Alfalfa $\frac{1}{2}$ Oats 15	Corn 5 bu.	Yield
None	Bordering & Leveling	Bench-terrace	Protected head erosion Contour Bordering & Leveling	Bordering & Leveling	Treatment
-	50.00	30.00	50.00	25.00	Cost Per Acre
					A
					B
					C
					G
					Class
Flood Irrigated Spring run-off. Abandon. Shallow Soil & Steep Slope.	Flood Irrigated Spring run-off. Steep & rolling.	Flood Irrigated Spring run-off.	Flood Irrigated Spring run-off.	Flood Irrigated Spring run-off.	Remarks

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LAND MANAGEMENT STUDY

QUAD. 26

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33.5	33.2	33.1	33	32	Tract No.
5	3	1	5	3	Acres
3 - 1/4	3/4	1/4	2.5%	1%	Topography
F.C.L.	F.C.L.	F.C.L.	Friable Clay Loam	Clay Loam	Soil
None	None	None	None	None	Alkali
Slight Sheet & Gully	S. Sheet	S. Sheet	S. Sheet	Slight Sheet	Erosion
Sufficient	Sufficient	Sufficient	Sufficient	Sufficient	Water
None	None	None	None	1	Expansion
Alfalfa & Blue-stem 5	Alfalfa & Blue-stem 3	Alfalfa - poor stand 1 acre	Alfalfa & Clover, Mixed. 1/2	Corn 3	Present Crops
Alfalfa Oats Wheat	Alfalfa, Wheat, Oats	Same	Same	Corn, Oats, Wheat	Suggested Crops
Alfalfa 1/2	Alfalfa 1/2	Alfalfa 1/2	Alfalfa } 1/2 Clover } 1/2	Corn 15 bu.	Yield
Bordering (Contour)	Bordering (Contour)	Bordering (Contour)	Bordering (Contour)	Bordering	Treatment
35.00	30.00	40.00	50.00	10.00	Cost Per Acre
X	X	X	X	X	Class A B C G
Flood Irrigated Spring run-off. May be made into fair farm. Small track around point of hill.	Flood Irrigated Spring run-off.	Flood Irrigated Spring run-off.	Flood Irrigated Spring run-off. Fair alfalfa. Pocket gopher	Flood Irrigated-Spring run-off.	Remarks

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LAND MANAGEMENT STUDY

QUAD. 26

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34	33.7	33.6	33.5	33.4	Tract No.
1	1	1	1	3	Acres
7%	2.5%	3%	2%	3%	Topography
F.C.L.	Clay	F.C.L.	F.C.L. & F.S.G.L.	F.C.L.	Soil
None	None	None	None	None	Alkali
Slight Sheet & Gulley	S. Sheet & Gulley	S. Sheet	S. Sheet & Main wash eating in- to farm.	S. Sheet & Gulley	Erosion
Sufficient	Sufficient	Sufficient	Sufficient	Sufficient	Water
No	1	No	No	No	Expansion
New Farm	Russian Thistle	Oats 1/2	Oats 1	Alfalfa & Blue-stem 1/2 acres	Present Crops
Wheat Oats Corn	Oats Wheat	Wheat Oats Corn	Oats Corn Wheat	--	Suggested Crops
--	--	Oats 8	Oats 10	Pasture	Yield
Levelling & Bordering	Contour Bordering & Leveling. Water should be diverted on the field.	Contour Bordering & Leveling	Border Around Edges.	None Abandon	Treatment
60.00	25.00	30.00	20.00	--	Cost Per Acre
			X		Class A B C G
X	X	X			
				X	
Flood Irrigated. Spring runoff. Considerable slope.	Flood Irrigated. Spring runoff. Probably soil too heavy.	Flood Irrigated. Spring runoff.	Flood Irrigated. Spring runoff. Soil type changes	Flood Irrigated. Let native grass come back.	Remarks

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35.3	35.2	35.1	35	34.1	Tract No.
6	1	1	2	2	Acres
3%	3%	2%	2%	3%	Topography
Friable Clay Loam	Friable Clay, Loam to Loam.	Friable S.C.L.	Friable S.C.L.	Clay	Soil
No	No	No	No	No	Alkali
Slight Sheet & Gully	Slight Sheet & Gully	Slight Sheet Erosion	Slight Sheet Erosion	S. Sheet & Gully	Erosion
Sufficient	Sufficient	Sufficient	Sufficient	Doubtful	Water
None	2	2	No	No	Expansion
Corn 6	Corn $\frac{1}{2}$ Beans $\frac{1}{2}$	Corn $\frac{1}{2}$ Wheat $\frac{1}{2}$	Corn 1 Oats 1	Corn 2	Present Crops
Oats, Wheat, Corn	Corn, Oats, Beans	Corn, Oats, Wheat, Alfalfa	Corn, Oats, Wheat	Corn, Oats, Wheat	Suggested Crops
Corn 15 bu.	Corn 10 Beans 3	Corn 10 Wheat 10	Corn 15 Oats 10	Corn 8 bu.	Yield
No. Subj. necessary	Bordering on Contour	Nothing. Crop rotation. Fall plowing.	No. subj.	Terracing	Treatment
30.00	30.00	-	-	30.00	Cost Per Acre
X	X	X	X	X	Class A B C G
Flood Irrigated Spring run-off. Only 3 acres planted this year.	Flood Mainly Dry. Water should be diverted from gulches. Head erosion Stopped.	Flood Irrigated. Spring run-off. Ma	Flood Irrigated. Spring run-off. May be possible to divert water from Arroya.	Flood Irrigated. Gulleys eating back into farm. Control necessary.	Remarks

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26

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17

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