AGRONOMY REPORT ON UNIT #3

General

1. The farming on L. M. U. #3 consists primarily of irrigated and flood irrigated land. Dry farming is not found to be very successful due to the lack of sufficient rainfall, which averages about 6.1 inches over a 5-year period. (See maps for rainfall record.)

2. .16% of the unit is farmed at present and this can be increased to .19% by the subjugation of potential land.

3. One outstanding feature of this unit is that the acreage of irrigated land exceeds that of the flood irrigated. Therefore, the farming is mostly concentrated into large areas.

4. Wind erosion affects practically all the farm land.

5. As a whole, the soil is very favorable for farming, but the problem of supplying sufficient water is the limiting factor for agricultural development.

6. The average length of the growing season observed over a period of 24 years at Tuba City is 179 days, beginning April 23 and extending to October 19.

II. Cultural Practices

There are two kinds of farmers found within this unit, the Hopi and the Navajo.

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The Hopi's not only practice a more modern type of agriculture, but they are more efficient users of the available farm land and water. Their land is usually bordered or terraced and protected where necessary against damaging flood waters. They raise a large variety of crops.

The Navajo's in most cases get by with as little work as possible in producing their crops and often this is done to such an extent that the productivity of the farm land is greatly reduced. Corn is the principal crop grown by the Navajo's; however, they do produce a few squash, melons and other vegetables on the more productive lands.

Very little farm machinery is used by either the Hopi's or Navajo's. The only common implements are the plow, the blade cultivator and weeder and hand tools such as the hoe, shovel, etc.

III. Agricultural Land Classification

On this survey 2,310 acres of present farm land were located.

This is divided into the three types of farming as follows:

Irrigated ———	1150 acres
Flood irrigated -	1050 acres
Dry farming ———	98 acres

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IV. Agricultural Concentrations

There are only three principal agricultural concentrations within this unit, listed as follows:

1. Tuba City and southeast
2. Moenave
3. Red Lake (Tonalea) and Cow Spring

Each of these areas has different characteristics, as follows:

1. Tuba and Southeast across Moencopie

The farm land found within this area represents the most valuable agricultural asset within the unit. Water is supplied from three principal sources: 1st, the Moencopie Wash; 2nd, Pasture Canyon; and 3rd, two small reservoirs immediately north of Tuba City.

1. The Moencopie Wash

At present there are approximately 780 acres of land being farmed from water supplied by the upper Moencopie diversion. Of this acreage, 340 acres are government-owned, 358 acres are owned by Navajo's, and 82 acres are owned by Hopi's. The land is all bordered and border irrigation is practiced. As a general rule the flow of the Moencopie Wash during the growing season is no more than sufficient to handle the present land and no potential land is proposed.

Flood water passes over approximately 100 acres of this land in about the central section

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of the farming area. This however is more of a detriment to the land than an advantage because of the heavy soil it deposits and the head erosion it causes. To remedy this it is possible and may be advisable to cut a channel through the farm land to carry the floodwater into the Moencopie Wash.

On several of the farms on each side of the Moencopie Wash head erosion is active and needs control before gullies form.

Sloughing along the Moencopie Wash is encroaching on the farm land and at one location is moving near the main irrigation channel. All the planting that could be carried out to protect the farm land should be done.

There is no subjugation work needed on the farm land other than the proper handling of water and proper tillage practices as could be carried out by someone charged with the supervision of the area.

White top weeds have been reported in two locations through this area and they should be controlled as soon as possible.

Another diversion dam has been constructed in the Moencopie wash below the present dam, but no land has been subjugated. The farming under this diversion will be dependent on using fall and spring irrigations with

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the exception of a very few occasions when all the flow is not diverted for use at the upper diversion during the growing season. In view of this fact, it is proposed that the acreage be limited to 100 acres and if the projects prove successful, the acreage can be increased later to approximately 400 acres if the water is sufficient.

To properly subjugate this land it will be necessary to fence the area, level and border the land and lay out a system of ditches. The main channels from the dam have already been constructed.

Planting is needed near the dam to help protect the banks from sloughing off and protect the dam from side cutting.

2. Pasture Canyon

The water from Pasture Canyon is used principally by Hopi farmers. They have approximately 196 acres, the Navajo's, 14 acres, and the government, 25 acres, which makes a total of 235 acres under this water source.

The Government land in this canyon is located near the head of the canyon and is all meadow or grass land used for pasture. Most of the area is swampy, with a high water table. It is proposed to put in drainage ditches through this area to drain the water into ditches and run it directly to the reservoir. By doing this,

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the ditches would probably drain the land sufficiently that garden crops and fruits could be successfully produced, where grass is now grown.

Below the Government farm a large sand dune is moving into the canyon and endangering the water supply and reservoir. This should be fenced and planted as much as possible to reduce the danger of the sand dunes moving into the canyon.

A definite ditch is needed from the reservoir to the Hopi farms rather than using the old gully bottom where the water meanders around and suffers a loss due to seepage and evaporation.

No work is needed on the Hopi farms except the proper supervision of water usage. As a general rule the available water is no more than sufficient to handle the present farms. However, if the water supply is increased by proper drainage and storage, there is more land nearby which could be placed under irrigation.

3. Reservoirs north of Tuba City.

The land irrigated from these two reservoirs is all Government owned. It comprises approximately 35 acres. It is located within Tuba City and is used by different Government employees and agencies within the Navajo service.

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No work or treatment is proposed on this area.

Beside the irrigated land listed under the three above sources there are approximately 330 acres of flood irrigated and dry farm land located southeast of Tuba City, the major part of which is Hopi-owned. The principal work needed is to spread the water more uniformly at the head of the gully fans where the farms are located.

2. Moenave

Water from small springs and seeps is supplied for all the farms within this area. Storage reservoirs have been constructed at the three following locations to make use of this available water.

1. At Moenave Day School
2. Moenave Demonstration Area Camp
3. East of Moenave D. A. camp along the Tuba-Moenave road.

The farm land under each of these reservoirs is terraced or bordered and well taken care of so that no work is needed. However, at the Moenave Day School, at the SCS camp and at the locations of farms 16 and 17 along the Tuba-Moenave road, reservoir sites have been located by the engineering branch, which could store the water for use during the growing season, that ordinarily runs to waste six months out of the year. Suitable farm land is available for expansion to the limit of the water developed at each

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of the reservoir locations. This land would require leveling and bordering and a system of ditches.

The acreage now farmed in this area is 107 acres and the estimated acreage that could be put under cultivation by the increased storage of the reservoirs is 36 acres. All of this land is inside of the Mocnave demonstration area fence.

III Red Lake

Cow Springs

In this area the major part of the farming is dependent upon flood irrigation. There is, however, one tract of approximately 20 acres which is irrigated from the Cow Springs lake. This is a fairly new development and the land now being farmed is a little rough and irregular. The farm land under this lake might be increased if the flood water from the gully just west of the lake were diverted into the lake. This would also stop the flooding out of crops below the irrigated farms where this gully now fans out.

On the balance of all the larger flood irrigated farms the chief problem is to control the excess floodwater. In some instances, the water can be diverted away from the farms to reduce this danger and in other cases, it is advisable to spread the water out more completely than is accomplished by allowing it to take its own course. Dry farming is not generally recommended for this section or the unit as a whole, due to the low annual rainfall.

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V.

The crops grown this year are shown as follows giving the acreage and per cent of the total acreage.

Crop	Acres	Percentage
Corn	1,260	54.54
Vegetables	101	4.37
Sudan grass	226	9.77
Idle	540	23.38
Orchard	70	3.03
Alfalfa	49	2.12
Squash	25	1.08
Melons	22	.95
Beans	17	.72
	2,310	100 %

VI. Yields

Estimated yields for the crops in this unit are listed as follows:

Corn	20 bu.
Sudan	3 tons
Alfalfa	2 tons
Squash	4,000 lbs.
Melons	4,000 lbs.
Beans	300 lbs.

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VII Suggested Crops

Suggested crops to be produced on this unit will vary somewhat with the type of farming. On the irrigated land at Moenave, Tuba City and Cow Springs, fruits, vegetables, alfalfa and various grains can be grown. The more valuable products should be encouraged. On the remaining portion of the farm land corn is the principal crop recommended, but beans, squash, melons and fruit trees can be grown at the more favorable locations where water is sufficient.

VIII Cost of Development

On Present Land

894 acres to be treated
Average cost, $11.36 per acre
Total cost, $10,155.00

On Potential Land

939 acres to be treated
Average cost, $7.41 per acre
Total cost, $6,959.00

Total cost of development on present and potential land is $9.36 per acre, or $17,114.00 for the 1833 acres to be treated.

T.C. 2353

Jack Hunter.

SUMMARY OF DISTRIBUTION BY DISPATCH OFFICE

Keyenta	Bales
Feb. 10	115
" 11	615
" 14	932
" 15	492
Total	2340

Pine Canyon	Bales
Feb. 7	319

Black Mesa	Bales
Feb. 16	330

Rodeway	Bales
Feb. 5	78

Cow Springs	Bales
Feb. 7	186
" 7	82
" 9	208
" 13	87
Total	503

Cow Springs and Coal Mine	Bales
Feb. 14	65
" 15	451
" 16	65
Total	581

Cow Springs and Coal Mine Jct.	Bales
Feb. 11	58

Coal Mine # 1	Bales
Feb. 7	20
" 7	34
Total	54

Comer Mine	Bales
Feb. 5	70

Cap-Cedar Ridge & Comer Mine	Bales
Feb. 6	556
" 8	143
" 9	61
" 10	82
Total	862

Howell Mesa	Bale
Feb. 5	4

Inscription House	Bales
Feb. 5	60
" 6	98
" 7	89
" 10	295
" 11	234
" 12	279
" 15	324
Total	1389

Kaibeto	Bales
Feb. 10	232
" 13	404
Total	636

Kaibeto Ben Pasture	Bales
Feb. 16	320

Keyenta Coal Mine	Bales
Feb. 14	283
" 16	119
Total	402

Keyenta Coal Mine Junction	Bales
Feb. 10	20

Kayenta Mine	Bales
Feb. 5	135
" 6	178
" 9	266
" 11	180
" 15	260
Total	1019
Total	

Moencopi Wash	Bales
Feb. 7	40

Kaibeto	Bales
Feb. 8	70

Red Lake	Bales
Feb. 8	18
Feb. 15	368
" 16	32
Total	404

Shonto	Bales
Feb. 8	194
" 9	178
" 10	201
" 11	261
" 13	322
" 14	239
Total	1395

White Mesa	Bales
Feb. 15	82

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Distribution of Food and Hay by Days

Date	Place	Bales Hay	Loads Wood	Groceries
2-5-49	Navajo Mountain	153		
	Shonto	134		
	Inscription House	80		
	Dotsonay	78	2/3	
	Round Rock	40		
	Keedmore	70	2/3	
	Copper Mine	70		
	Total	647		
2-6-49	Navajo Mountain	178		
	Pine Canyon		2	Blue Canyon-200 # Flour
	Inscription House	98		100 # Beans
	Gap	156		100 # Sugar
	Total	632		10 Cn Baking Pwdr
				40 # Coffee
				100 # Lard
				10 Pkg Salt
				20 Cn Apricots
				10 Cnl Milk,Cnd
2-7-49	Blue Canyon	319		
	Coal Mine #1	20	1/3	Coal Mine - 2 cans Tomatoes
	Cow Springs	106		2 " Apricots
	Coal Mine #1	34		4 " Milk
	Cow Springs	52		2 pkg Salt
	Inscription House	89		1 can Coffee
	Rosencopi Wash	40		1 can Baking Pw
	Total	930		4 cts Lard
				10 # Sugar
				15 # Beans
				25 # Flour
2-8-49	Shonto		1	
	Gap - Cedar Ridge - Copper Mine	163		
	Red Lake	15		
	Total	161		
2-9-49	Cow Springs	308		
	Lower Paiute		2	
	Gap	81		
	Shonto	176	1	
	Navajo Mt.	266	1	
	Total	931		
2-10-49				
	Shonto	201		
	Kaibeto	233		
	Gap	82		
	Inscription House	395		
	Keyenta -Coal Mine Jct	20		
	Keyenta	115		
	Total	945		

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BLIZZARD EMERGENCY

Distribution of Feed and Hay by Days

Date	Place	Bales Hay	Lbs. Feed	Operation
2-11-49	Navajo Mt.	150		
	Kayenta	618		
	Inscription House	234		
	Shonto	551		
	Cow Springs Jct.	65		
	Total	1653		
2-12-49				
	Inscription House	272		
	Total	272		
2-13-49				
	Kaibeto	404		
	Shonto	322		
	Cow Springs	57		
	Total	783		
2-14-49				
	Kayenta	982		Cow Springs Coal Mine
	Shonto	239		200 lbs. Beans
	Cow Springs Coal Mine	65		2 cs. Coffee
	Kayenta Coal Mine	283		3 cs. Milk
	Total	1019		1 cs. Salt
				2 cs. Baking Powder
				1 cs. Raisins, 30 lbs.
				1 cs. Peaches, 25 lbs.
2-15-49				1 cs. Tomatoes, 2 doz. cans
	White Mesa	82		3 cs. Apricots, 2 doz. cans
	Red Lake	366		100 lbs. Sugar
	Cow Springs Coal Mine	251		36 lbs. Lard, 1 # cts
	Navajo Mt.	289		800 lbs. Flour
	Kayenta	430		
	Inscription House	224		
	Total	2063		
2-16-49				
	Red Lake	20		
	Black Mesa	355		
	Kayenta Coal Mine	119		
	Cow Springs Coal Mine	65		
	Ram Pasture, Kaibeto	337		
	Total	854		
	GRAND TOTAL	10974		

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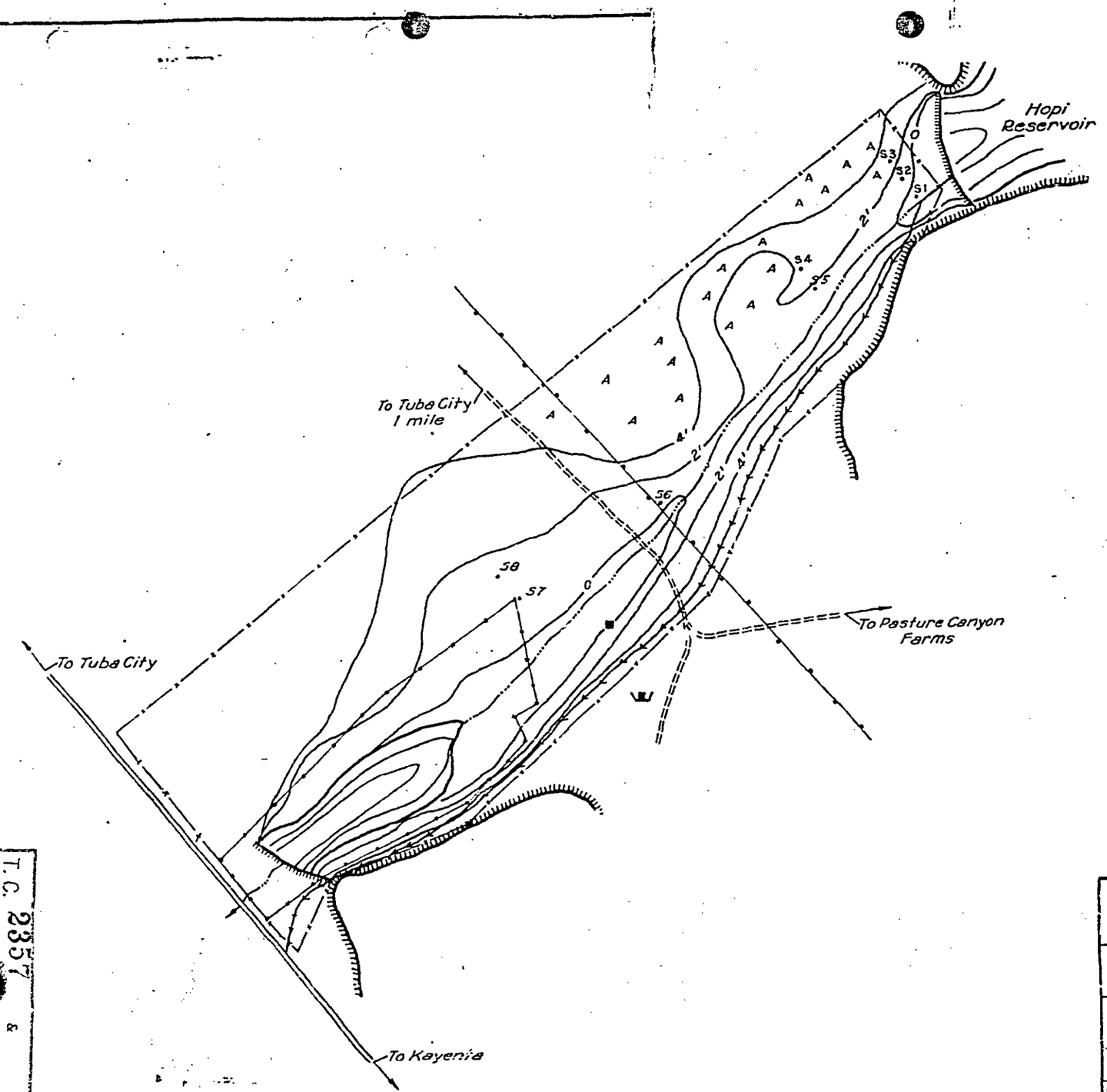

LEGEND

- A Alkali areas
- 2 Water table contours 2 foot intervals - 3/11/57
- S.1 Soil sample location
- Canal
- Stream
- Fence
- Fence (proposed)
- Telephone line
- Primary road
- Secondary road
- Dam
- Bluff
- Dipping vat

T.C. 2357 8 58

WATER TABLE SURVEY PASTURE CANYON.

NAVAJO AREA

GALLUP, NEW MEXICO

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
REGION EIGHT

REFERENCE:			SCALE:	
Base Map CCCID			1" = 600 ft.	
COMPILED	TRACED	CHECKED	REVISED	N-2303
A.F. Johnson	J. Williams			

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