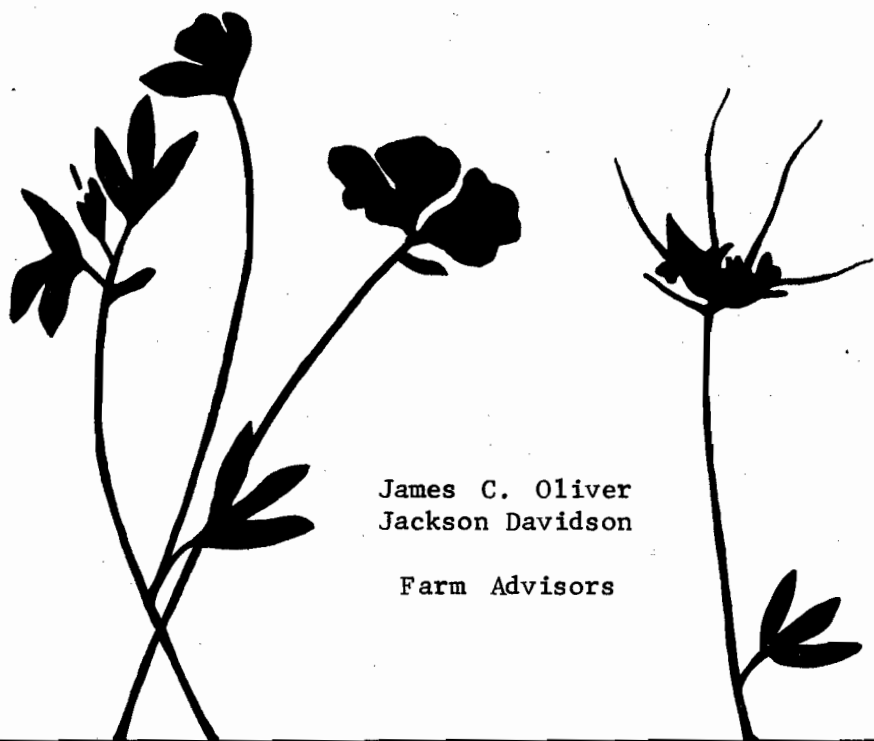


IRRIGATED PASTURES

in san bernardino county



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IRRIGATED PASTURES

IN

SAN BERNARDINO COUNTY

Irrigated pastures in the valley areas of San Bernardino County are chiefly associated with dairying or horses for exercise yards and waste management purposes. On the high desert, some growers use them to supply roughage for livestock as well as exercise yards.

The Goals of Good Pasture Management

To produce efficiently as much meat or milk per acre as possible.

To obtain and continue the highest possible grazing capacity per acre.

To use the feed when its nutritive value is at its peak.

To maintain an adequate stand and balance of legumes and grasses throughout the pasture season.

These goals can be achieved, with a good yield of quality food, if you:

- . Grade and prepare the land to get efficient irrigation and good drainage of excess water.
- . Use an adapted and compatible mixture of legumes and grasses.
- . Apply the right kind and amount of fertilizer.
- . Control weeds.
- . Manage grazing and supplemental harvesting to fully use the feed produced.
- . Manage irrigation properly.

Types of Soils

Irrigated pastures can grow on a wide range of soil types--from sandy loams to heavy clays.

Heavy soils are best because of their greater water-holding capacity. This reduces the frequency of irrigations for shallow-rooted crops.

Alkaline soils can be used if proper drainage and adequate leaching of soluble salts are provided.

Seedbed Preparation

Land grading to rigid specifications, while expensive, is the most important operation in establishing an irrigated pasture. Proper land preparation will greatly reduce future costs of irrigation and weed control.

Nothing can substitute for a well-prepared seedbed. Plowing before seeding turns under trash and weeds. After plowing, the land should be disked, landplaned, and harrowed to form a firm seedbed. Seed should not be renovated into an old sod.

Pastures can be sown into undisturbed grain or sudan stubble by using a light harrowing and a cultipacker to cover broadcast pasture seeds.

REMEMBER--One of the best weed control methods is to sow the pasture mix into a clean seedbed.

Date of Planting

October 15 to November 14 is by far the most satisfactory in the San Bernardino area.

A February or March planting gets strong competition from annual weeds. Summer plantings

are successful if sprinklers and an abundant supply of water are available. They are not recommended unless water can be applied every three to five days.

In the high desert area, plant during the latter part of August and September. Spring plantings are not recommended due to high winds and summer weed competition.

Methods of Planting

A firm seedbed is essential for a good stand. Seed across borders so that borders will sod over.

Do not cover seed more than 1/2 to 3/4 inch deep.

Excellent results have been obtained from using a ring-roller seeder. This type of seeder can be rented from local companies for a small charge per acre.

Seed may also be broadcast, and then covered lightly. A spike-tooth harrow with the teeth sloped back or a cultipacker can be used to cover the seed.

A fall seeding can usually be lightly grazed by March or April. Heavy grazing should be deferred until midsummer.

At the time of planting, 100 to 150 pounds of ammonium phosphate fertilizer should be disked into the soil approximately two inches deep.



IRRIGATION

There are several methods of irrigating permanent pastures. The methods most commonly used in San Bernardino County are the border-check, contour-check, corrugation, wild flooding, and sprinklers.

Border-Check

This method of irrigation is recommended for heavy soils which are fairly level.

Soil type, slope of land, and quantity of water available are the general limiting factors in deciding width and length of the check. The following table gives suggested check sizes for the various soil types.

<u>Soil Type</u>	<u>Gallons Per Min.</u>	<u>Width In Feet</u>	<u>Length In Feet</u>	<u>Slope</u>
Sands	450-900	20-30	250-350	3'12"/100'
Loams	450-900	30-40	450-650	2- 7"/100'
Clays	450-900	30-40	650	1- 3"/100'

If the land is level, the border-check method is most commonly used. Proper leveling and grading are very important.

Water efficiency is generally much lower than with sprinklers, but the initial equipment cost is not as high.

Proper height and width of the borders are a necessity. Borders should be 12 to 14 inches high before settling occurs.

Sprinkler Irrigation



Sprinkler irrigation is most popular where:

- . land is rough or uneven
- . water is limited or expensive
- . soil is very shallow
- . leveling is impractical or too expensive

Its disadvantages are:

- . high initial costs
- . poor adaptibility to windy areas
- . time and labor involved in moving pipe
- . higher power costs

How Much Water?

Again, soil type dictates how much and how often water should be applied. Most roots are in the top 2 to 2½ feet of soil. Water going below that depth would be wasted. To penetrate to a depth of 1 foot in--

- sandy soil - it takes 1 inch of water.
- loam soil - it takes 1½ inches of water.
- clay soil - it takes 2½ inches of water.

During the summer, pastures in sandy soils will require water every five to nine days. In loam or clay soils, irrigate every 10 to 15 days.

Total water used will vary from 4 to 7 acre-feet in the Chino area; 6 to 10 acre-feet in the high desert.

Using a soil auger or shovel to examine moisture content of the soil in the root zone will help in finding out how frequently to irrigate.

1971. IRRIGATED PASTURE COSTS IN SAN BERNARDINO COUNTY

ESTIMATED COSTS PER ACRE TO ESTABLISH:

Plow	\$ 5.10
Harrow	2.53
Level	2.14
Form Borders	.62
Irrigate	4.52
Fertilize	14.45
Disk	2.60
Harrow	2.53
Plant	21.15
Irrigate	4.25
Total	\$59.89

TOTAL CASH COSTS PER ACRE:

Irrigate 20 x	\$49.00
Fertilize 2 x	15.40
Mow 3 x	3.15
. Cash overhead (accounting, pickup, office, etc.)	3.50
. Repairs (irrigation system, fences, equipment, etc.)	2.50
. Taxes (based on highest economic use of farm land)	
market value--valley = \$1000/A	25.00
(high desert \$400/A	
taxes = \$10/A)	
Total	\$98.55

NON-CASH OVERHEAD COSTS PER ACRE:

		<u>INVESTMENT</u>	<u>DEPRECIATION</u>	<u>INTEREST</u>	
Land		\$1,000.00	-----	\$40.00	
Equipment (10-year life)		75.00	\$ 7.50	3.00	
Building and Fences (20-year life)		10.00	.50	.40	
Irrigation System (30-year life)		90.00	3.00	3.60	
Stand (6-year life)		59.89	9.98	2.40	
		<u>\$1,234.89</u>	<u>\$20.98</u>	<u>\$49.40</u>	<u>\$70.38</u>
					Total
					<u>\$168.93</u>

These estimates are based on the assumption that the land is properly leveled and graded to accommodate flood irrigation. Costs do not include booster pump, irrigation pipe, and distribution system.

Labor Costs:

Tractor driver	\$2.50/hr
Irrigator	2.00/hr

Equipment Operating Costs:

Tractor--40 hp	\$1.10/hr	Level	0.05/hr
Tractor--20 hp	0.45/hr	Border Disk	0.40/hr
Disk	1.10/hr	Fertilizer Spreader	0.20/hr
Plow	1.70/hr	Drill	1.60/hr
Harrow	0.16/hr	Water	6.00/acre-foot

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Pasture Mixtures For Low Elevation Areas:

<u>CATTLE</u>	<u>APPROXIMATE LBS. OF SEED PER ACRE</u>
18% Perennial Rye	6.0
12% Annual Rye	4.0
15% Orchardgrass	5.0
15% Alta Fescue	5.0
15% Meadow Fescue	5.0
10% Alfalfa	3.5
10% Ladino Clover	3.5
5% Narrowleaf Trefoil	2.0

HORSES

15% Perennial Rye	5.0
10% Annual Rye	3.5
20% Alta Fescue	7.0
15% Meadow Fescue	5.0
15% Dallisgrass	5.0
12½% Mammoth Red Clover	4.5
12½% Alfalfa	4.5

Mixtures For Heavy, Poorly-Drained Soils:

60% Alta Fescue	21.0
12% Annual Ryegrass	4.0
12% Dallisgrass	4.0
16% Narrowleaf Trefoil	5.5

Use 30 to 40 pounds per acre of the above mixtures when excessive manure or barn washings are applied. High planting rates will compete better with weed seed carried in manures.

Plant 10 to 15 pounds per acre of oats or barley for nurse crop in high wind hazard conditions.

<u>ALL LIVESTOCK</u>	<u>APPROXIMATE LBS. OF SEED PER ACRE</u>
12% Perennial Rye	2.0
10% Annual Rye	2.0
10% Dallisgrass	2.0
18% Orchardgrass	2.5
20% Alta Fescue	3.0
10% Narrowleaf Trefoil	2.0
10% Alfalfa	2.0
10% Salina Strawberry Clover	2.0

Plant 16 to 20 pounds per acre of the above mixtures. Add 10 to 15 pounds per acre of oats or barley for nurse crop, especially for late fall plantings or high wind hazard conditions. Spring planting is not recommended.

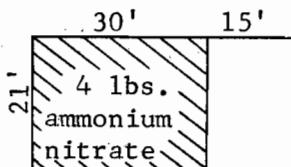
Fertilization

Tests conducted in San Bernardino County have shown that nearly all pastures will respond to applications of fertilizer. Grasses will respond to nitrogen applications, and the legumes need phosphate.

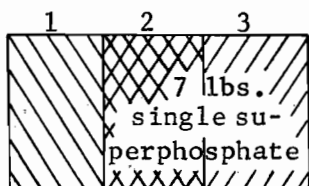
Most pastures in the county require about 75 to 100 pounds of actual nitrogen per year, and 50 to 75 pounds of phosphate. This is especially true of older irrigated pastures.

Here is a simple test that can be conducted:

Select an area approximately 21' x 45'. Step off 30' of the plot and apply 4 lbs. of ammonium nitrate.



Then from the other end of the plot, step off 30'. To this area, apply 7 lbs. single superphosphate.



This will give three plots:

1. 60 lbs. nitrogen per acre
2. 60 lbs. phosphate + 60 lbs. nitrogen
3. 60 lbs. phosphate

After the test application, there should be a growth response to nitrogen in two to three weeks (in summer). Phosphate will require a longer period of time.

The test will not tell the rate of fertilizer per acre to apply, but will tell if there is a shortage. Further experiments, using different rates of fertilizer, will be necessary to determine the proper rate for each particular type of soil.

To supply the nitrogen (100 lbs. N) and phosphate (75 lbs. P_2O_5), any one of the following combinations could be applied annually:

1. 300 lbs. ammonium nitrate
150 lbs. treble superphosphate
2. 300 lbs. ammonium phosphate
(16-20-0)
150 lbs. ammonium nitrate
3. Approximately 2 tons poultry manure
4. Approximately 5 tons barnyard manure

This would be best applied in a split application in January or February, and June or July.



Rotational Grazing

Rotation of livestock should be timed with irrigations and plant growth. Grazing pastures when they are wet will increase soil compaction.

Plants should be grazed when nutrition, palatability, and yield are at an equilibrium. In nearly all cases, this will be just before bloom of legumes or heading of grasses.

For rotational grazing, the field should be divided into at least five paddocks. This would allow grazing each paddock for seven days, and allow the pasture to regrow for 28 days.

Each large paddock may be subdivided with an electric fence and strip-grazed in successive days. This promotes more uniform grazing.

Weed Control

1. Mechanical

Most of the annual weeds in the pasture can be controlled by mowing before they go to seed.

2. Grazing

Many palatable weeds, such as lamb's-quarter and morning glory, will be controlled by grazing when the pasture is young.

3. Chemical

Thistles and many undesirable broadleaves may be controlled by spot treatment with 2,4-D, or 2,4-DB.



Mowing and Harrowing

Pasture should be mowed to insure uniform cropping and a proper balance of grasses and legume species. Mow when necessary, but usually three times a year will suffice.

Harrow the pasture whenever necessary to spread cattle droppings. After a rain or an irrigation is best, as the droppings break up and spread more easily at this time.

Supplemental Feeding

Forage from irrigated pastures alone is often too low in dry matter to meet the nutritive requirements of growing animals. An exception to this rule would be idle horses.

For this reason, dry roughage should be available. It also helps reduce bloat, and gives variety to the diet.

Any kind of dry hay can be used. This can be fed in the field, preferably in bunkers or racks. Fattening cattle will require a grain supplement.