

IRRIGATED

PASTURES

IN

KERN

COUNTY



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IRRIGATED PASTURES IN KERN COUNTY

by

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Irrigated pastures have not met with general favor as a crop in Kern County. It is difficult to get sufficient production to make it economically feasible to compete with other crops on good land. Irrigated pastures, however, have been grown extensively on land where reclamation is the first order of business and feed for cattle is secondary.

In this circular the term "saline" will be used to indicate soluble salts; "alkali" will indicate high sodium. Soils needing reclamation would be considered as saline, saline-alkali, or alkali soils. Soil amendments needed for reclaiming the different types of saline-alkali conditions will not be treated in this circular. Nevertheless, much of the circular will be written with soil reclamation in mind.

Pastures fit well into soil reclamation as several grasses and legumes have considerable tolerance to saline-alkali soil conditions. A common practice is to put a new piece of land needing reclamation into irrigated pasture for three to five years-perhaps longer in some cases- and then replace the pasture with higher value crops after the soil is sufficiently reclaimed.

Another use of irrigated pasture is on small acreages near farm homes. Many people enjoy having some green pastures and a few cattle or

horses. The pastures in these instances more often than not are grown on good land.

Planting Dates

Irrigated pastures may be planted in the fall or spring. Fall seeding months are October and November, with spring seeding during February and March. The fall seeding is preferable.

Bermudagrass should be planted in late spring or early summer.

Annual sudan or sudan hybrids should be planted in the spring after the danger of frost.

Barley or oats for annual winter pasture should be planted during early fall months.

Irrigation

Pasture may be irrigated by sprinkler or by flooding, with the border method of flood irrigation being most generally used.

Uniform distribution and penetration of irrigation water is difficult at best in some of the problem soils. It is therefore important to give careful attention to leveling and grading. The grade in direction of slope is usually .2 to .4 foot per 100 feet of length. For problem soils with poor internal drainage, not less than .3 foot per 100 feet should be used to enhance surface drainage. The cross slope should not be over .15 foot.

Seedbed Preparation and Planting

The ideal pasture seedbed is firm, although not hard or packed. After preliminary operations such as discing, harrowing and bordering, the soil should be cultipacked or ringrolled to produce a firm seedbed. The seed may be broadcast and covered by rolling or planted with a grass seed attachment on a grain drill. One successful method is to cultipack to firm the soil, broadcast the seed and cultipack again to firm the seed into the soil. One commercial seeder takes care of this whole operation at one time. It is a ringroller, then a seeder and another ringroller. Seed should not be planted more than 1/2 inch deep. Many methods of sowing are successful, but any method is satisfactory which gives a uniform distribution and covers the seed 1/4 to 1/2 inch deep in a firm surface.

Fertilizers

Pasture grasses respond to application of nitrogen when adequate irrigation water is supplied, and if growth is not restricted by alkali or excessive salinity, or in some cases by lack of phosphorus.

Up to 400 lbs. of nitrogen per acre annually have been used; however, 120 to 160 lbs. of nitrogen per acre is more common. Nitrogen fertilizer should be applied periodically--perhaps every 4 to 6 weeks--rather than applying the whole annual amount at one time.

Phosphorus is not considered to be generally needed but there are some cases where phosphorus in addition to nitrogen is needed. In some cases

cases phosphorus or sulfur may be needed to maintain an adequate balance of legumes to grass in the pasture.

Soils which need additional phosphorus usually are well known to the landowner, and usually involve land which previously has been farmed and is often sandy type soil. When needed, the total annual supply of phosphorus can be applied at one time--35 to 40 pounds per year of phosphorus (80 to 95 pounds P_2O_5) by the application of from 450 to 500 lbs. of single super phosphate per acre.

Inoculation

Legume seeds should be inoculated with nitrogen-fixing bacteria. This is particularly important for newly developed land which has not had previous legume crops. There are different inoculums for different legume groups, such as the alfalfas, trefoils and clovers; therefore the commercial inoculant should be specific to the particular type legume seed being inoculated.

Commercial inoculants--with directions for application--are available from seed dealers. Seed brokers also sell pre-inoculated seed. When purchasing pre-inoculated seed, make sure it has been recently inoculated and has not been exposed to high temperatures while in storage.

Bloat

Bloat in cattle is an ever constant concern when grazing clover and alfalfa pastures. There

are different practices which can be used to reduce the incidence of bloat. The surest way to avoid bloat is to use a pasture mix without alfalfa or clover. This would involve only grasses and birdsfoot trefoil. Trefoil is a legume which does not produce bloat.

More mature pasture growth is less apt to produce bloat than an immature, luxuriant growth.

Hungry cattle should be filled with hay--preferably sudan or barley hay--before being turned into a possible bloat producing pasture. If possible, free-choice barley, hay, straw, or sudan hay at all times will materially reduce the incidence of bloat.

For some unknown reason, bloat is a greater problem in the floor of the San Joaquin Valley of the county as compared to the mountain valleys, such as Glennville, the South Fork Valley at Weldon, and Tehachapi. Ladino clover is seldom used in the floor of the Valley because of bloat; yet, Ladino has been used to some extent in the mountain valleys without much concern.

Molybdenum

Some soils of Kern County have an excess of the element molybdenum. Molybdenum is taken up by the pasture plants and in turn causes toxic symptoms in the cattle. Pasture forage can be analyzed by commercial laboratories for molybdenum content; 8 to 10 ppm (parts per million) usually will cause some borderline trouble with 20 to 30 ppm or more expected to cause severe toxicity. Affected cattle scour severely, lose weight rapidly and change hair color. Red

cattle turn to a dull yellow and black cattle a yellow-gray color. Moderate toxicity is shown by some individual cattle scouring and some showing strong color changes, but generally only moderate color change. Mild symptoms are evidenced by little if any scouring and color change in only a few individuals. Even with mild toxicity, the cattle do not gain and perform as well as they should.

Molybdenum toxicities can be corrected with the use of copper sulfate. Feedings at one gram per head per day will prevent trouble, in most cases. On severe conditions, two grams may be needed. One satisfactory method of administering the copper sulfate is to use a salt-grain-copper mix free-choice. One worked out here and which has proved satisfactory to use is:

50% ground barley or milo
30% salt
18-3/4 % bone meal
1-1/4% copper sulfate

This mix is based on the cattle consuming 1/6 of a pound of mix a day. At this rate they would get one gram of copper sulfate daily. Some variation from this consumption level need not cause concern, as even a half pound of mix a day would be only three grams of copper sulfate per head daily. The consumption can, however, be closely regulated by altering the percentage of ground grain and the percentage of salt.

Copper can also be administered by injection. This product, copper glycinate, has the trade name of "Cumol" and is available at veterinary supply houses.

Internal parasites may cause symptoms similar to molybdenum. In fact, cattle may have both. Veterinarians in the county are well acquainted with these problems and can diagnose whether it is one or the other, or both, and recommend the necessary treatment.

Ergot

Ergot has only been a very minor problem in Kern County. It is a fungus which attacks some grasses when the seed heads are forming. The ergot first causes a sticky honeydew on the seed heads followed by dark violet to black "spurs" growing out of the individual seed or grains of the grass. At the later stage it closely resembles smut. On Dallisgrass ergot does not form the dark, spur-like enlargements but develops light, pinkish bodies not much different in appearance from the seed. It has the characteristic honeydew.

Cattle that have consumed toxic amounts of ergot exhibit a staggering gait, are highly nervous, have trembling muscles and nervous outbursts during which they may or may not fall.

Mowing the pasture and keeping it grazed often enough and short enough to prevent seed heads from forming will practically eliminate the ergot problem.

In Kern County ergot has been identified on ryegrass, tall fescue and Dallisgrass. However, as far as the writer knows, it has caused trouble only on the ryegrass, and the trouble was avoided thereafter by mowing and closer grazing to prevent seed head formation on the grass.

Pasture Management

Fencing a pasture into separate fields, rotating the cattle from field to field is an accepted grazing practice. A good system is to divide a pasture into six fields and graze the cattle about five days on each field. This gives a 25-day regrowth period between grazings.

The number of fields and the lengths of time to graze each will vary with different operations and different irrigation systems. The important thing is not to graze on wet ground. This causes soil compaction and reduced water intake rate. This condition results in a reduction of desirable plant types, encourages weedy plant types and provides a habitat for mosquitos.

Regular clipping of pasture can be done to prevent clumping from uneven grazing or from around manure spots.

A well located, well constructed corral in conjunction with the pasture is important. This is often the best place to provide stock water, salt and hay or grain supplements when they are used.

Pasture Plants

Alfalfa. Normally considered a hay crop, alfalfa is often used for pasture, both in pure stand and in combination with grasses. Alfalfa is a fine forage producer, but may cause bloat in cattle. The bloat hazard is reduced by feeding sudan or barley hay with it and by letting it mature before grazing. Even with the aids for reducing bloat, there is no sure prevention

and bloat is the reason alfalfa is not extensively used for cattle pasture. Alfalfa is tolerant to sodium and moderately tolerant to salinity.

Birdsfoot trefoil - The narrowleaf (prostrate) type of trefoil is best adapted to Kern County conditions. Trefoil does not cause bloat in cattle so has met with considerable favor because of this characteristic. It has a wide range of soil and temperature adaptation. Trefoil is a slow grower in the seedling stage and therefore difficult to establish in combination with other more vigorous pasture plants. It is reasonably persistent once a stand is established. Trefoil has a good tolerance to salinity.

Salina clover - Salina is a superior producing strain of strawberry clover. It is moderately tolerant of salinity but has given a good account of itself under many high salt conditions. It, however, has shown a low tolerance to boron. It is a cool season variety, producing most abundantly during the fall and spring months.

Ladino clover - A white clover used extensively in many other areas of California, and is used to some extent in the mountain valleys in Kern County. It is used very little in the San Joaquin Valley of Kern County because of the high incidence of bloat when cattle are pastured on it. A cool season grower, most of its production is in the fall and spring. Ladino is considered low in tolerance to salinity.

Sweet clover - Yellow blossom is the variety most used. It is a biennial with moderate tolerance to saline-alkali conditions, so fits well into soil reclamation.

Red Clover - This biennial is not recommended for the San Joaquin Valley part of the county, but performs well in the higher elevation mountain valleys. It is quite palatable to both cattle and horses, with some horsemen being particularly enthusiastic about having this clover in the pasture.

Black Medic - There are no general recommendations for using medic, but it does well in the mountain valleys and seems particularly well adapted to mountain meadows in the South Fork Valley area at Weldon and Isabella.

Tall Fescue - This grass is both highly praised and strongly condemned by pasture people in the state. It is praised for being a rugged, widely adapted, long season, high forage producer. It is condemned because it is too aggressive, unpalatable, clumps too badly, and cattle are reputed to make poor gains on it. The pros and cons are probably all correct, at least to a degree. It is recommended for use in Kern County as there doesn't seem to be any other grass, or combination of grasses which will grow over as long a season and produce as well under as many conditions as tall fescue. Frequent clipping and fertilization with nitrogen will prevent clumping and increase palatability. It is tolerant to salinity and moderately tolerant to sodium.

Orchardgrass - A perennial bunchgrass, quite palatable to cattle, and considered a high quality feed. It has some limitations for the Valley floor of the county, however. It is a cool season grass with a winter dormancy and also slows down to becoming almost dormant during the heat of the summer. It has a moderate to low tolerance to the high salts found in our saline-alkali soils where most of our pastures are used.

It is a different story, however, at higher elevations. It is well adapted to our mountain valleys and performs exceedingly well under these conditions. It is the grass of choice for areas such as Tehachapi and Lebec.

Ryegrass - There are both annual and perennial type ryegrasses. The annual ryegrass is often used to give a quick, early pasturage. This fast, early growth may or may not be good. It does provide pasture a little sooner, but also provides competition for the slower starting perennial grasses which will have to be depended upon for future pasture. The perennial ryegrass is a short-lived, perennial, cool season grass. It does not produce well during the hot summer months. About two or three years is as long as it will last in a pasture. Ryegrasses are moderately tolerant of saline-alkali soils and quite palatable to cattle.

Prairie Bromegrass #25 - This variety of brome is a short-lived perennial which serves much the same purpose as ryegrass. It is suggested to be used in place of perennial ryegrass where there is a history of ergot on ryegrass. The seed is a large, chaffy-type seed, making it a

little difficult to mix with other grasses and legumes at time of seeding. It is moderately tolerant to salinity and is palatable to cattle.

Tall Wheatgrass - A coarse bladed perennial bunchgrass that tolerates extremely high amounts of both saline and alkali soil conditions. It has even been found to have considerable tolerance to boron. It is recommended where soil reclamation is being done, as it will grow where little, if anything else survives. Although it has low palatability, cattle can live on it.

Rhodesgrass - A summer growing perennial with good salt and alkali tolerance. It is fair in palatability but seems to be more palatable when grown on good soil than when grown on saline-alkali soils. Its ability to take up salts may affect its palatability, but still makes it worthwhile when being used for soil reclamation. It is recommended in most pasture mixes to provide additional summer feed on good soils and on soils undergoing reclamation.

Dallisgrass - This is an aggressive, summer growing perennial, used somewhat interchangeably with Rhodesgrass. Altho it does not have the same salinity tolerance of Rhodesgrass, it is moderately tolerant and does produce heavily during warm weather. It is sometimes considered too aggressive and has a long winter dormancy. It is considered fair in palatability.

Bermuda - Much can be said for and against the Bermudagrasses. Some growers object to Bermuda

because of its weedy nature, its long winter dormancy and being lower in palatability than many other grasses. It is, however, highly productive during the summer months. Growth can be materially increased with high amounts of nitrogen fertilizer. It is quite tolerant of both salinity and alkali. It has the ability to survive under stress conditions such as a shortage of moisture or a heavy or constant grazing use. Common bermuda has long been used in the valley and most farmers are well acquainted with it.

Coastal bermuda has been grown to a limited extent. Once established, it produces quite well. It is a non-seed producing variety and, therefore must be propagated by stolons. The expense of vegetative propagation and the length of time to establish a stand are the main reasons this variety has not been, and probably will not be used to any great extent.

NK 37 is a giant variety of seed-producing bermuda. It probably will be the variety of choice for growers who want bermuda.

Annual Pastures

Sudangrass, or the sudan-sorghum crosses, in summer, and barley or oats in winter usually will produce far more feed than will the perennial type pastures. There is the disadvantage of a farming operation twice a year, but does offer a way of using annual crops to produce an abundance of forage for use as pasture or hay. These are moderately tolerant to saline-alkali conditions.

Suggested Pasture Mixes

1. Good, well-drained soil.

	<u>Lbs/A.</u>	<u>% Mix</u>
Alfalfa	1	5
* Salina	1	5
Birdsfoot trefoil (narrowleaf)	2	10
Ryegrass, perennial	2	10
Rhodes or Dallis	2	10
Orchardgrass	7	35
Tall fescue	5	25
	<u>20</u>	<u>100</u>

* If seed of Salina is unavailable, replace with common strawberry clover or yellow sweet clover.

On sandy type soils, replace Salina with yellow blossom sweet clover.

2. Saline-alkali soil

	<u>Lbs/A.</u>	<u>% Mix</u>
Birdsfoot trefoil (narrowleaf)	2	10
* Salina	2	10
Ryegrass, perennial	4	20
Rhodes or Dallis	2	10
Tall fescue	5	25
Tall wheatgrass	5	25
	<u>20</u>	<u>100</u>

* If Salina is unavailable, replace with common strawberry or yellow blossom sweet clover.

3. Saline-alkali soil

	<u>Lbs/A.</u>	<u>% Mix</u>
NK 37 Bermuda	5	100

4. Mountain Valleys

	<u>Lbs/A.</u>	<u>% Mix</u>
Ladino clover	2	10
Ryegrass, perennial	4	20
Orchardgrass	14	70
	<u>20</u>	<u>100</u>

Or -

5. Mountain Valleys

	<u>Lbs/A.</u>	<u>% Mix</u>
Ladino clover	2	10
Birdsfoot trefoil (narrowleaf)	1	5
Ryegrass, perennial	3	15
Orchardgrass	10	50
Tall fescue	4	20
	<u>20</u>	<u>100</u>

6. Horses - San Joaquin Valley

	<u>Lbs/A.</u>	<u>%Mix</u>
Ladino Clover	2	10
Ryegrass, perennial	2	10
Rhodes or Dallis	2	10
Orchard	4	20
Tall fescue	10	50
	<u>20</u>	<u>100</u>

7. Horses - Mountain Valleys

	<u>Lbs/A.</u>	<u>%Mix</u>
Ladino clover	2	10
Red Clover	2	10
Ryegrass, perennial	4	20
Orchard	7	35
Tall Fescue	5	25
	<u>20</u>	<u>100</u>
