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FARM ADVISOR FACTSMAXIMIZING IRRIGATED PASTURE PRODUCTION IN
SAN LUIS OBISPO COUNTYby
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The purpose of this fact sheet is to explain how to overcome the most common problems involved in establishing and managing irrigated pastures in San Luis Obispo County. Before starting an irrigated pasture, you should also read two University of California Cooperative Extension publications entitled Irrigated Pastures in California (Circular 545) and Salina Strawberry Clover which deal in more detail with this subject.

ASSETS OF IRRIGATED PASTURE

An irrigated pasture can be a valuable source of feed for livestock either as the only forage or as a supplement to seasonal dryland range or other feeds. Its most economical use is as a replacement for more expensive feeds such as hay or protein supplements. This is usually the way it is used in a commercial operation where the main forage is dryland range. Here, irrigated pasture is used either when there is not enough dryland forage available or when it is too low in protein such as during the summer and fall.

If it is to be used as the only feed, it will take about a half acre of excellent irrigated pasture to support a mature horse or cow or five mature sheep during the best part of the growing season which is March through October. Additional feed will be needed the rest of the year. Part or all of this supplemental feed requirement can be met by feeding hay or silage made from early-season irrigated pasture growth.

ESTABLISHING A NEW PASTURE

Preparing a weed-free seedbed, correctly seeding the pasture and irrigating it adequately (if rainfall is insufficient) for maximum seedling establishment are three critical steps in producing a good pasture. Mistakes made in these practices are difficult to correct later and may lead to reseeding.

Seedbed Preparation Weed control is a major consideration. Land grading, where feasible, will increase irrigation efficiency and reduce weed and mosquito problems caused by low spots. If the land has not been farmed or in irrigated pasture, it should be farmed to one or more crops such as oat hay, cereal grain or sudan grass in order to clean up the weeds. A weed spray can be used in these crops to control broadleaf weeds if present. After the crop is harvested, the field can be disked and then rolled with a ring-roller or a cultipacker. If weeds are very bad, it may pay to irrigate after the crop is harvested and then disk after the weeds have germinated.

The firming of the seedbed with a ringroller or a cultipacker before seeding is very important for good seed germination. The seedbed must be firm (although not hard packed) so that the seed will not be planted too deep or loosely in the soil. The idea is to have a firm seedbed so the seed can be pressed in with a roller to a depth no deeper than 1/2 inch, preferably 1/4 inch.

Seed and Seeding Seed represents a small part of the investment, so insist on high germination and purity. Certified seed will assure this. Be certain also that legume seeds are freshly inoculated, preferably with a pelleting process. This will insure that the legumes will have the bacteria which fix nitrogen from air for use by plants.

The seed can be sown with a broadcast seeder, a drill, an airplane or a ringroller with a seeding attachment. Any method that applies the seed uniformly without burying it too deep is acceptable. Ringrolling or cultipacking should follow the seeding operation to cover the seed and to firm the soil around the seed for maximum moisture retention.

Recommended Seed Mixes

		<u>Pounds seed/acre</u>
Beef and Dairy:		
Salina strawberry clover		4
Annual ryegrass		2
Perennial ryegrass		3
Orchardgrass*		6
Total		15

*Do not use Palestine orchardgrass in irrigated pastures.

		<u>Pounds seed/acre</u>
Sheep:		
Salina strawberry clover		4
Horses:		
Perennial ryegrass		2
Annual ryegrass		2
Fawn tall fescue or orchardgrass		8
Birdsfoot trefoil (narrowleaf)		2
Salina strawberry clover		2
Total		16

OR

Fawn tall fescue	12
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Moisture and Seedling Establishment Fall seedings can be established with little or no irrigation provided winter rains come regularly and hot spells are not a problem. It is safest, however, to have the irrigation system ready to go at seeding time in case the rains start and then discontinue. For spring plantings, frequent irrigations are often essential to allow the plants to grow through the critical period from germination until a good root system is established. Irrigating 2 or 3 times a week may be necessary during hot weather in order to keep the seed and root zone moist. To reduce the amount of irrigation and yet not subject the new plants to cold winter weather before they are big enough to take it, the best time to seed is October.

IRRIGATION OF ESTABLISHED PASTURES

Once the pasture is established, a very important management practice in keeping it productive is irrigation. The timing of irrigations and the amount of water to apply must be based on a knowledge of the moisture in the soil and the plant requirements for water. A water supply of 6 gallons per minute for each acre is adequate for sprinkler irrigation. The seasonal requirement will be 2 1/2 to 4 1/2 acre-feet per acre.

During the summer, it is usually necessary to apply 3 inches of water every 7 to 14 days. The more frequent intervals are required in the hotter areas whereas the coastal pastures need less frequent waterings.

In the spring, it is important to begin irrigating before the soil has dried out. Don't wait until April to start the pump if the last rain was in February. Spring should

be a very productive season for an irrigated pasture if it has enough moisture. Fall is also a productive pasture season, so don't mothball the pump too early either.

An inexpensive soil sampler available in farm catalogs is very useful in finding how deep the moisture is present in the soil. Keep in mind that clovers can use moisture down to a depth of 2 feet and grasses down to 3 to 4 feet. Since both legumes and grasses are in the pasture, adequate soil moisture should be maintained throughout the entire root zone of all plants. This means irrigating often enough to keep the shallow-rooted clovers growing vigorously and deep enough for the long grass roots. The aim is to keep an even balance of grasses and clovers in maximum production. For the clovers, try to keep the top six inches of soil from becoming completely dry. However, do not put livestock on the pasture until after the surface has dried because the soil may become compacted which will reduce water penetration, lower production and may require deep plowing for correction.

FERTILIZATION

Like irrigation, the fertilization program has a lot to do with the production of the pasture and the relative abundance of grasses and legumes. Keep in mind that all legumes (clovers, trefoils and alfalfa, for example) thrive on phosphorus and sulfur but will supply nitrogen for themselves and associated grasses if phosphorus, sulfur and the correct nitrogen fixing bacteria are present.

Grasses, on the other hand, cannot provide their own nitrogen so they depend on nitrogen fertilizer or associated legumes for this element. It is cheaper, of course, to let the legumes provide the nitrogen rather than to buy it.

The objective should be, therefore, to establish about a 50:50 ratio of grasses and legumes, correct phosphorus and sulfur deficiencies if indicated by soil or plant analyses, and allow the legumes to provide the nitrogen.

Many soils in this county are deficient in phosphorus. A phosphorus soil analysis by a reputable laboratory will tell you if you should apply a phosphate fertilizer. Soils with a content of less than 10 parts per million available phosphorus will usually respond well to phosphate fertilizer. Contact a farm advisor for information on soil sampling and how to interpret test results.

On soils acutely deficient in phosphorus, 250 to 600 pounds of single superphosphate may be needed annually to provide satisfactory growth of legumes. Since this fertilizer contains 12% sulfur, it will also correct sulfur deficiencies which are common in this county.

In pastures where few or no clovers are present and they can't be increased without plowing and reseedling, nitrogen fertilization will probably be required for maximum grass growth. Under average irrigation conditions, a single application of 30 to 40 pounds of nitrogen will be effective for only about one month. Fertilizing with 150 to 200 pounds of ammonium sulfate or 70 to 90 pounds of urea every month will keep grasses well-supplied with nitrogen. Such stimulation of grass growth, however, can crowd legumes out of the pasture, especially if grazing pressure is light or phosphorus and sulfur levels aren't maintained.

WEED CONTROL IN ESTABLISHED PASTURES

If the seedbed has been prepared as recommended in this fact sheet, it will be much easier to control weeds later. After a new pasture has reached a height of 10 inches or more, it should either be grazed or mowed to keep the annual weeds from competing with the slower-establishing pasture perennials. If the pasture is irrigated, grazed and fertilized so that the seeded perennials become well established and maintained for high

production, they will then usually keep out most annual weedy species. Perennial weeds such as dock and sedge, however, may persist and require drainage facilities or herbicide application for control.

MOWING

Mowing can be beneficial in both new and mature fields in reducing weeds and promoting even cropping and full utilization of forage which in turn enhance pasture quality. Removing coarse stalks and seedheads of vigorous grasses greatly improves utilization. Surplus growth is usually available in the spring which can be used for hay or silage. The type of machinery available for mowing or clipping will partly determine the height of cutting but about 3 to 6 inches of stubble is suitable.

HARROWING

Pasture should be harrowed regularly to spread the droppings of cattle and prevent bunched growth around manure clumps. Harrowing for this purpose is especially effective after an irrigation. A flexible type springtooth harrow does a better job of breaking up and spreading the manure than does the rigid type.

GRAZING MANAGEMENT

Two main considerations in the management of grazing are: 1) to stock the number of livestock which will result in optimum forage production and utilization and 2) to avoid soil compaction by keeping livestock off the pasture when the soil is too wet, a problem which is greater on clay soils than on sandy soils.

It is important to stock enough livestock to keep the clovers from being crowded out by the grasses but not so many animals that the root and leaf systems of the plants are inhibited. By maintaining about a 50:50 mix of vigorous clovers and grasses, maximum forage production and utilization by livestock will result.

If soil compaction is not a problem, as on very sandy soils, it is possible to attain maximum production by continuous grazing of livestock. However, on clay soils where compaction can be a problem, livestock should be rotated between two or more fields to avoid grazing during and just after irrigation. Closer grazing is recommended here than for the continuous method since the plants have time to recover between grazings. Fencing into separate fields also gives you the option of growing hay in one pasture while grazing animals in another.

INTERSEEDING WITH CLOVER

The preferred method of renovating an old pasture is to plow and crop to an annual before reseeding. However, pastures with a low population of legumes can sometimes be improved by drill- or broadcast-seeding Salina strawberry clover among the established grasses. Seeding 2 to 4 pounds of clover with 300 pounds of single superphosphate per acre following a close grazing is recommended. Pastures with many bare spots may only need a broadcast seeding whereas dense pastures should be seeded with a heavy-duty drill when the soil is moist. Grazing to restrict grass competition and several frequent irrigations will help the seedlings get started. It takes about one year for the strawberry clover to become well established since it spreads by creeping stems that root at the nodes.

BLOAT

Bloat is a hazard when cattle or sheep are grazed on pastures containing a high percentage of clovers or alfalfa. Ladino clover causes a somewhat greater bloat problem than does Salina strawberry clover although dense, closely-grazed stands of Salina can cause livestock deaths. Bloat is reduced when grasses are allowed to grow tall enough to compete with clovers. This can be achieved by moderate grazing (preferably on a rotation schedule), nitrogen fertilization and irrigating deeply but not too frequently.

MOLYBDENUM

Some soils of San Luis Obispo County have an excess of the element molybdenum which is taken up by pasture plants and can cause toxic symptoms in cattle. Severely affected cattle scour, lose weight rapidly and change hair color. Even with mild toxicity, cattle do not gain and perform as well as they should.

Molybdenum toxicities can be corrected by feeding copper sulfate at the rate of one gram per head per day in a salt-grain mix or liquid supplement. Copper glycinate injections will also provide the required copper.

Since internal parasites cause symptoms similar to molybdenum toxicity, a veterinarian should be consulted for diagnosis and treatment recommendation.

GOPHERS

Pocket gophers cause problems in pastures by forming extensive burrowing systems that cause irrigation water loss and reduced forage production. Trapping or hand-baiting operations can be effective on small pastures with limited numbers of gophers. On large acreages with an abundance of gophers, however, the mechanical tractor-drawn gopher bait applicator has replaced the more time-consuming methods. More details are found in Cooperative Extension Leaflet #2699 entitled Pocket Gopher Control with Mechanical Bait Applicator.

