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PASTURE CROPS FOR
COLORADO

By WALDO KIDDER



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PASTURE CROPS FOR COLORADO

By WALDO KIDDER.

Crops providing good pasture for livestock are needed on practically every Colorado farm. Practically every farm has some livestock for which pastures will furnish an abundance of palatable nutritious feed at a low cost. And in each section of the state there is an increasing tendency on the part of the farmers to keep more livestock to consume otherwise unsalable feed, and turn it into valuable meat or milk products. As the various pasture crops provide an excellent source of feed thru the growing season for these livestock operations they have proved themselves to be among the most valuable crops now grown in the state.

Pasture crops are being grown and used to advantage under each type of farming in Colorado. On irrigated farms many pasture crops are grown and used in profitable feeding of dairy cattle, beef cattle, hogs, sheep and horses. Under non-irrigated conditions the need for pastures is great and when grown have proved their value with all classes of stock. Even on the mountain ranches where the livestock is run on the open range and where alfalfa is the main crop, pastures are needed to provide early spring feed and eliminate danger of injury to stock.

Not only are pasture crops adapted to the various types of farming but they can be used with profit in the production of all classes of livestock. For the farm with dairy cattle, pasture crops furnish an excellent succulent feed of high value in abundance and provide the best and cheapest feed for dairy production. Grass is the natural feed for cattle, and a grass pasture not only supplies this excellent source of feed but also cuts down the labor and provides a comfortable, sanitary place for the dairy cows during the summer. For beef cattle, pastures provide plenty of good feed from early in the spring until late in the fall. It is particularly suitable for cows and cows with calves. As pastures provide an early feed free from bloat they are greatly appreciated in the early spring months, when hay is short and the National Forests are not ready for the stock to be turned on them. Pastures also save considerable feed in the fall after the stock has been brought in from the range. The legume pastures such as alfalfa or sweet clover, are well suited to hog production, and have been proved to materially cheapen the cost of producing pork. Sheep also use pasture crops to good advantage, however, with a farm flock of sheep it may be well to provide for fre-



IRRIGATED PASTURE MIXTURES KEEP DAIRY CATTLE IN HIGH PRODUCTION

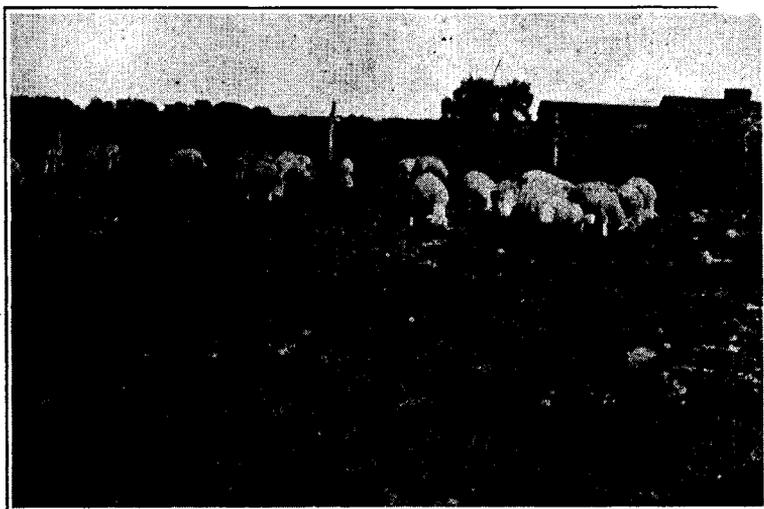
quent plowing and rotation of the pasture crop to prevent disease. Work horses are easily kept in condition by having a pasture to turn them into evenings and days when they are not at work in the field. Thus pastures are adapted to all classes of stock, have been proved to be one of the best sources of feed for stock, and the various pasture crops are adapted to all sections of Colorado.

Good pasture crops provide green feed from early in the spring until late in the fall, which is very palatable and succulent, and makes an excellent feed for dairy cows or growing stock. Pastures provide such a large amount of feed that land in pastures produce more feed than a similar acreage in other crops, and the pasture eliminates the expense of harvesting and feeding the crop. Stock kept on pastures are more comfortable and sanitary than when kept in dry lots. With all of these advantages every Colorado farmer growing livestock should have some pasture for their use.

Pasture crops for best results should provide all of the following:

Palatability	Long life
Good feed value	Freedom from injury to stock
High yield	Adaptation to soil conditions

Under irrigation pasture-grass mixtures have been proved to meet the above pasture requirements very successfully—a



THIS FARM FLOCK WAS LAMBED OUT ON PASTURE. OVER 115 PERCENT LAMB CROP
SAVED

mixture seeming to meet all of the requirements better than any one or two grasses by themselves. The grasses usually used in Colorado pasture mixtures are brome, orchard, meadow fescue, timothy, perennial rye, together with some of the clovers which yield well and do not bloat stock, such as sweet clover or Ladino.

Alfalfa and sweet clover are often used alone as pastures on irrigated lands.

On the non-irrigated lands, especially in the lower altitudes where the temperature is fairly high and the rainfall from 14 to 17 inches, cultivated grass mixtures are not uniformly successful, and the pasture crops recommended are fall rye, sweet clover and sudan grass usually grown separately.

In the high altitudes, without irrigation, where the rainfall is from 17 to 20 inches and the temperature fairly cool, grass mixtures of brome, slender wheat grass, and sweet clover are giving excellent results.

THE CULTURE AND USE OF PASTURES ON IRRIGATED LANDS

Soils for Pastures.—Practically all Colorado soils are adapted to the growing of pasture grasses under irrigation. Soils best adapted to the growing of grasses are the silt loams and the heavier sandy loams. Grasses as a rule do not root over four to six feet deep, so the soil should be well drained for at least six

feet deep. As pasture crops are heavy producers of stalk and leaf growth, the soil should be fertile.

For best results with irrigated pastures, irrigation water should be available at all times during the growing season as the grasses need frequent irrigations to make the largest amount of growth. For the best irrigation of pastures a large head of water is desirable, so that the ground can be quickly covered, giving a fairly light irrigation.

Grasses for Irrigated Pastures.—A mixture of grasses is recommended to produce the greatest amount of pasture, for a mixture will yield better, will meet different weather conditions more successfully and provide good pasturage at all times of the year. A word about the standard grasses used in Colorado will help in planning the pasture mixture:

Brome grass (*Bromus inermis*).—Brome grass is a long lived, fairly deep-rooted grass, which starts growing very early in the spring, persists thruout the summer even when hot and dry, and lasts until late in the fall. It is one of the heaviest producers of forage, which is of high palatability and feed value. It is a sod forming grass, so should be in every irrigated pasture. Brome grass prefers loam or clay loam soil, but does well in sandier soils. Due to its ability to withstand drouth it is one of our best grasses for non-irrigated sections which will grow tame grasses, as well as for the irrigated districts.

Orchard grass (*Dactylis glomerata*).—Orchard grass is another of the highest yielding grasses under Colorado conditions. It is adapted to clay loam or silt loam soils. It also does well on the lighter soils. It requires a fair amount of moisture. Orchard grass starts growing very early in the spring, and produces an abundance of leafy growth thru the summer and until late fall with but few seed stalks. Orchard grass is a bunch grass. As it does well in the shade it should be grown in a mixture with other grasses.

Meadow Fescue (*Festuca pratensis*).—Meadow fescue is a deep-rooted, long-lived grass, adapted to practically all soils. It furnishes a fine palatable growth, especially in the middle of the summer and late fall. It does not start to grow as early in the spring as orchard or brome grass nor does it make quite the amount of feed. Its palatability and production during the hotter months gives it a place in every irrigated pasture mixture. It requires only a medium amount of water.

Yellow sweet clover (*Melilotus officinalis*).—An irrigated pasture should have some legume in it to furnish the protein feed

wanted for best livestock growth. Because of the rank production which sweet clover makes, and because of its palatability and high food value and freedom from bloat, sweet clover is used in most irrigated pastures. The yellow-blossom variety tends to reseed itself and makes a better pasture than the white, so it is the recommended variety.

Ladino clover (*Trifolium repens latum*).—This giant white clover is a new clover which is coming into prominence on some of the heavier soils and in the lower altitudes. Where plenty of irrigation is available it makes an abundance of feed as a pasture crop, and is practically free from bloat. The seed is very small, and care must be taken to get a stand.

Timothy (*Phleum pratense*).—Timothy is one of the best known hay grasses. It is best adapted to the cool, moist, well-drained soils, not having a great deal of resistance to drouth nor tolerating much heat. Timothy makes a quick growth, so is used in many irrigated pastures in the northern part of the state and in the higher altitudes. It is not a sod former, and is not a very long-lived grass. It is one of our lowest producers of feed.

Perennial rye (*Lolium perenne*).—Perennial rye-grass is a short-lived grass which is recommended only in the warmer sections of the state under irrigation where it oftentimes replaces timothy in the irrigated mixture.

The grasses above mentioned are recommended for the well-drained soils, which can be irrigated regularly. Mixtures for such soils are given below:

Pasture Mixtures Recommended for Well Drained Irrigated Soils

Heavy seeding.—(Morton's Mixture)—When an especially quick sod is desired or seedbed preparation is only fair, this mixture gives the best results:

Brome grass	15 lbs.
Orchard grass	15 lbs.
Meadow fescue	10 lbs.
Timothy	6 lbs.
Yellow sweet clover.....	4 lbs.
Per acre	50 lbs.

A modification of this, which has given excellent results and is most generally recommended where the seedbed has been well prepared and where the seed can be properly planted—is as follows:

Brome grass -----	9 lbs.
Orchard grass -----	9 lbs.
Timothy -----	4 lbs.
Meadow fescue -----	5 lbs.
Yellow sweet clover -----	3 lbs.
Per acre -----	30 lbs.

For pastures in the warmer sections of the state under irrigation, the following mixture should be used:

Brome grass -----	9 lbs.
Orchard grass -----	9 lbs.
Perennial rye (optional) -----	6 lbs.
Meadow fescue -----	5 lbs.
Yellow sweet clover -----	3 lbs.
Per acre -----	32 lbs.

For wet lands the following mixture would be recommended:

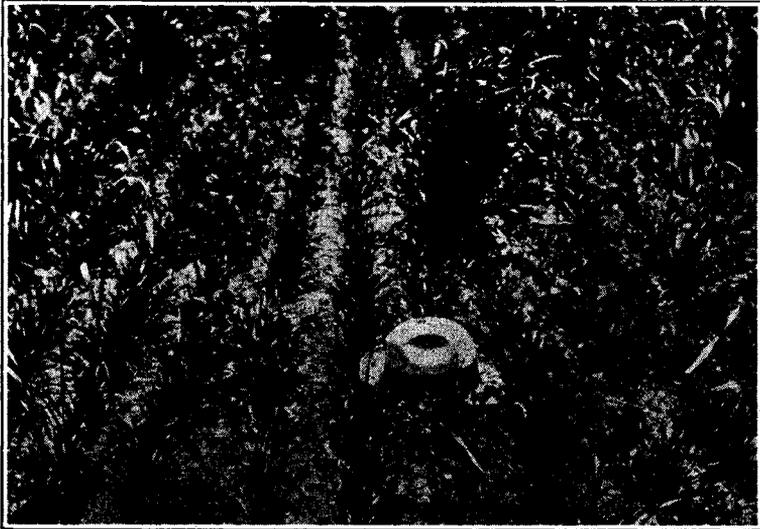
Redtop -----	10 lbs.
Timothy -----	6 lbs.
Alsike -----	4 lbs.
Per acre -----	20 lbs.

Preparation of Seedbed

Grass seed, being very small, must be seeded for best results on a very well-prepared, firm seedbed. In preparing this kind of seedbed fall plowing is best. Land should be thoroly worked down in the spring, floated, leveled and harrowed after



SEEDBED SHOULD BE DEEP, FIRM AND FULL OF MOISTURE. HARROW AFTER LEVELING



DRILLING OF SEED SECURES BEST STANDS. NOTE EVEN STAND IN THIS FIELD

floating to make a well-packed, firm, fine seedbed full of moisture. It may be well to delay planting of the grass seed until weeds have started to grow, when they should be harrowed out. When the seedbed has been thoroly prepared the grass seed may be planted usually with best results by seeding thru a grain drill and using a grass seeder attachment for the heavier seeds. The lighter grass seed should be mixed together and put into the grain drill. The heavier seed, as timothy and sweet clover, should be seeded thru the grass seeder attachment. For thirty-pound seedings of the mixture, the grass seeder planting the timothy and clover, should be set at four quarts, and the grain drill seeding the other grass seed, should be set to seed from two bushels to two and one-half bushels of oats, which will usually seed about 30 to 35 pounds of the seed per acre. This is usually the right amount for well prepared soils. The drill should be checked to make sure that the proper amount of seed is being planted per acre. Drilling is preferred to broadcasting of seed if the ground has been well prepared and the drills do not run too deeply. Cross drilling is preferred to drilling only one way. Grass seed should not be covered over an inch to an inch and a fourth. If the drill is running deeper than this it may be well to take the grain tubes from the shoes and the seed allowed to fall directly behind the disks, after which the field should be harrowed.

If the seed is to be broadcasted it should be seeded in two seedings, the lighter seeds mixed together and seeded, then the heavier seeds mixed together and seeded, after which the field should be well harrowed. Immediately after seeding it is usually advisable to mark out the field with furrows from 24 to 30 inches apart to enable irrigation using a small amount of water and getting over the field quickly. Laterals thru fields should be 300 to 400 feet apart, to insure getting the water thru the furrows quickly.

Nurse Crops.—If a nurse crop is to be used it should be an early maturing barley, as it does not shade the ground as much as oats and matures earlier than wheat. The nurse crop is seeded at about half the usual rate, and should be drilled in before the grass seed is sown. Nurse crops are recommended for the heavier soils which crust, as they will shade the ground sufficiently to prevent heavy crust formation. On the non-crust-forming soils the use of a nurse crop is usually not recommended, as the yields of grass are higher the first year or two after seeding than where a nurse crop is grown. On soils that wash easily nurse crops should be used to facilitate irrigation. If a nurse crop is used the grower should keep in mind that it is the grass which is the main crop the first year, and not the nurse crop, and should handle the field to get the best stand and production of grasses. As soon as the nurse crop has matured it should be immediately cut and removed from the field and the pasture irrigated at once.

Irrigation.—The surface of the soil should be kept moist until the grass is well started. This will require irrigation, every week to ten days if rainfalls are not frequent, until the grass has germinated. After the grass is well started irrigation every two weeks is sufficient. Pasturage should not take place during the first year, especially if grown with a nurse crop.

If the grass is not grown with a nurse crop it will make a better sod, a larger amount of growth, will be capable of carrying stock earlier the second year, and will many times make a cutting of hay the first year. The second year's care of pasture should include the cutting of one crop of hay from the land and then pasturing in the fall. From that time on the pasture can be used from early spring until late fall for many years.

Handling Pasture.—When pasturing land under irrigation it is well to keep stock off the pasture when the soil is wet. Growers have found that it is advisable to divide irrigated pastures into two lots, irrigating one and letting it get a start, while the other half is being pastured. With this method of irrigation and recuperation pasturage has been increased from 15 to 25 percent.



HAY SHOULD BE CUT FROM THE PASTURE THE SECOND YEAR BEFORE PASTURING

It is well to keep stock out of pastures after heavy rains until the ground has had some chance to dry. This prevents puddling of soil and increases production.

· **Manuring Pastures.**—The production of feed on pastures can be greatly increased by a frequent top dressing of from five to ten loads of barnyard manure per acre, applied in the fall or winter. After such top dressings the manure should be harrowed in. Such practice has been known to increase the carrying capacity of pastures sometimes as much as 50 percent.

Hog Pastures.—Alfalfa has proved to be the best pasture for hogs. There is but little need for discussion on culture of alfalfa since it is grown on practically every irrigated farm. Alfalfa being used for hog pasture should not be pastured until the second year, and should then not be pastured too close. It is well to divide the alfalfa pasture, irrigating one-half and letting it recuperate, while the other half is being pastured. When alfalfa is used as a hog pasture it is necessary to plow it up at the end of two or three years pasturing, because after that time the stand gets poor and production less. Sweet clover is often used for pastures on irrigated lands and produces an abundance of good feed.

Temporary Pasture Crops for Irrigated Land.—Temporary pasture crops on irrigated lands are usually catch crops seeded after some other crop has failed, or are crops that are grown with some other crop and pastured after the main crop has been removed. The most commonly used of these temporary pasture

crops on irrigated land is sweet clover. This is seeded with small grain in the spring at the rate of ten to fifteen pounds per acre. After the small grain has been harvested the sweet clover is irrigated and then is ready for pasturage. Such a crop will furnish pasture for from two to three months the first year, and will carry from one to three head per acre. Sweet clover may be pastured the second year with profit, but is usually plowed under as a green manure crop for soil improvement, for which it is one of the best crops. Other temporary pasture crops under irrigation are oats or barley, which make a fair pasture for a short length of time. In some of the warmer sections sudan grass is also used as a catch crop, furnishing a good amount of pasture for from three to four months. The sudan grass is drilled in at the rate of 20 to 25 pounds of seed per acre, from June 1 to July 1, and is pastured after the crop gets six to eight inches high. Sometimes the growth gets too rank, and a crop of hay should be taken from it.

Rosen and Petkus rye are often used as a temporary pasture crop under irrigation, seeded at the rate of 60 to 75 pounds of seed per acre. This crop will provide pasture for from two to three head of stock per acre for from three to four months.

THE GROWING AND USE OF PASTURE CROPS ON NON-IRRIGATED LAND

The prevailing amounts of precipitation received on our non-irrigated lands varies from 12 to 18 inches. Where the lower amounts of rainfall are received, and in the region where the average temperature is high, it is of but little use to try any of the common grasses for a permanent cultivated pasture crop. There are, however, sections at a higher altitude where more moisture is received and the temperature is cooler, where the grass mixtures do well.

Grasses used for a permanent, non-irrigated pasture should include brome, slender wheat grass, sweet clover of which the yellow variety is usually most desired as it produces a finer-stemmed, more leafy growth, and in some cases, meadow fescue.

Seedbed Preparation.—On the non-irrigated lands as well as on the irrigated lands the matter of preparation of the seedbed is of greatest importance. The seedbed must be firm and full of moisture. Fall-plowed land, summer fallow or disked corn ground, disked lightly before seeding to kill weeds and form a slight mulch, are recommended. Late spring plowing on the dryland before planting grass seed is a waste of time unless special care is taken to work the ground.

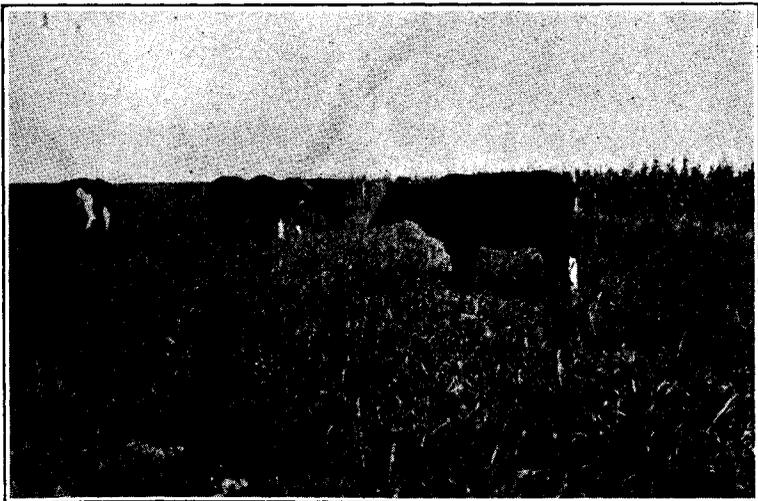
Non-irrigated Grass Pastures—Grasses should be seeded in the following proportions for the non-irrigated pastures:

Brome grass	33 1/3%
Slender wheat grass	33 1/3%
Yellow sweet clover	33 1/3%

Use 10 to 15 pounds of this mixture per acre.

The seed may be sown broadcast or thru a drill and should be planted as early in the spring as possible. After planting the ground should be well harrowed to cover the seed and also to pack the dirt over it. If possible a cultipacker should be used to firm the ground. No nurse crop is recommended with this grass unless the ground blows badly. If the weeds get too high they should be clipped to conserve the moisture and raked off of the pasture crop as soon as possible. The pasture should not be used until the second year, after which time it should never be pastured too heavily.

Chief Non-irrigated Pasture Crops.—For the largest part of our non-irrigated regions, temporary pasture crops such as fall rye, sudan grass and sweet clover are the ones which should be grown. Several of these pasture crops should be grown on each farm to provide pasturage at different seasons of the year. One of the most successful combinations is the Rosen or Petkus rye and Sudan grass combination. The rye is seeded early in the fall or early in the spring and furnishes fall



SUDAN GRASS PASTURE GIVES EXCELLENT RESULTS ON NON-IRRIGATED LANDS

and spring pasture, or spring pasture up until about the time the dry, hot weather usually starts, which is about the middle of June to the first of July. Sudan grass will be planted in an adjoining field drilling the seed or planting it in rows about the first of June. Sudan grass should be seeded only after all danger of frost is passed, as it is a warm weather crop and will not start to grow until the soil has thoroly warmed up. When seeded in rows, from two to six pounds of seed per acre is used. If the seed is planted with a grain drill, or seeded broadcast, from ten to fifteen pounds per acre is required. The crop will be ready to pasture when it is from four to six inches high, which is usually from the first to the tenth of July. Sudan grass is then pastured until the middle of September, or until frost kills the crop. Then the fall planting of rye is again ready for pasturing and will furnish pasture until usually late in November, or until snow covers the land. Sometimes Sudan grass may have to be cut for hay, as it produces too rank a growth for best pasture unless there is a large number of stock on the field. As soon as the hay is cured and removed from the field, the new growth can be pastured again until frost.

Sudan grass is a sorghum, so care should be exercised not to pasture the crop when stunted by drouth or hot wind or frost. If such conditions occur stock should be removed from the field. The stunted crop may be cut for hay and cured, or the crop may



RYE ON NON-IRRIGATED LANDS PROVIDES EXCELLENT PASTURE

be pastured after growing conditions have become such that the crop is again growing vigorously.

Sweet clover has proved its adaptability and value as a pasture crop on the dryland. It lasts only two years but makes an abundance of feed useful either for pasture or hay. Sweet clover should be seeded on a firm seedbed such as summer-fallow ground, fall-plowed land or cornstalk or stubble ground. The only spring preparation before seeding should be a light disking to kill the weeds. Sweet clover seeded at the rate of from 8 to 10 pounds of seed per acre is best. Usually no nurse crop is planted with it, altho at the Akron Colorado Experiment Station stands of sweet clover have always been secured by using a nurse crop but the clover has often been killed by permitting this nurse crop to head. On sandy lands or soils that blow some protection must be given, either with stubble, manures or a nurse crop. It seems possible that if the nurse crop was cut as it started to joint that it might be possible to control the weeds and secure a better stand of sweet clover than if no nurse crop was used. The sweet clover should be pastured only lightly the first year. If a crop of hay is taken early the second year, it should be cut high and just before the clover starts to bloom. If clover is too old or cut too close to the ground the taking of a hay crop will kill it. By using the yellow-blossomed variety, which is more branching and finer stemmed than the white, and as pasturing does not get all of the blossoms, it usually reseeds itself so that the yellow-blossomed, sweet-clover pasture becomes practically a semi-permanent crop. Sweet clover on non-irrigated land is one of the best adapted of the protein producing feeds and should be on more non-irrigated farms.

Temporary Pasture Crops for Non-irrigated Lands.—Temporary pasture crops that are easy to start and which produce an abundance of good feed for a short time are oats and barley. These should be planted early to supply early spring pasture. They are as a rule thru with their usefulness by the first to the middle of June.

RESULTS SECURED FROM PASTURES

After grass mixtures have become well established farmers are finding that irrigated pastures will carry from two to three head of mature cattle per acre for from four and one-half to six months. This is equivalent to the production of from five to eight tons of hay per acre, and saves the cost of putting up the hay and feeding it. Also, the stock produce better and are in a better condition. With the non-irrigated pastures, we find that

the crops such as rye and sudan, particularly where used in combination, carry from two-thirds to one and a half head of mature cattle per acre for from four to five and one-half months. Sweet clover on non-irrigated lands has been carrying from one to two head per acre for from five to six months, or equivalent to two or three tons of alfalfa per acre. In the higher altitudes the grass mixtures have carried one to two head per acre for five months. These results show the value of pasture crops in supplying feed and in cutting down the cost of feeding livestock. One farmer in the Eaton territory made the statement that altho his pasture was on very high-priced land it was worth more than any other crop grown on like acreage on his farm. Considering the abundance of feed produced, the health of the animals, and the economy of production, pastures should be grown on every farm in Colorado having livestock.

Range cattlemen are finding that they can well afford to have part of their meadow land devoted to grass mixtures to provide early spring and late fall feed. Many of them are cutting from one to two tons of hay per acre from this pasture after grazing in the spring, and find that the aftermath saves large quantities of feed in the fall, or, the pasture is often used thru-out the summer for the cow and calf herd with excellent results.

For every condition, and with each class of livestock, there is a pasture crop which is adaptable and which will reduce the feed cost in livestock production. For this reason pastures are one of Colorado's important crops, and should be grown more extensively than they are now.