Alfalfa In Colorado

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By R. H. Tucker and D. W. Robertson

Alfalfa over a period of years has been the most important crop of Colorado in farm value. Its cash value does not represent by any means all the benefit of alfalfa to Colorado's agriculture. It is the basis of our irrigated crop rotations, a principal roughage of winter rations for livestock, and the basic forage in our extensive livestock-fattening industries. With a good crop rotation and with the farm manure produced by the feeding and fattening of livestock, it is possible to maintain a profitable level of soil fertility for crops on irrigated land.

Alfalfa is admirably adapted to nearly all of our irrigated soils in Colorado. With our soils that are rich in lime and with our abundance of sunshine, the production of good yields and high-quality hay is possible. In tests by the Agronomy Section, Colorado Experiment Station at Fort Collins, alfalfa hay produced more digestible nutrients per acre than corn, barley, oats, or other feed crops.

The harvested acreage of alfalfa in recent years has been close to 20 percent of the irrigated crop acreage, exclusive of native meadow land. From the standpoint of best soil fertility this acreage might well approximate 25 percent or an increase in alfalfa acreage. Also, from a soil standpoint there is no advantage in leaving alfalfa in a rotation for more than three crop years.

Varieties

A summary of yield experiments at Fort Collins conducted by the Agronomy Section, Colorado Experiment Station, shows the following:—

Variety	Av. Tons Per A.	Years Grown
Meeker Baltic	5.24	18
Colorado Common	5.14	13
Hardistan	5.08	15
Ladak	5.03	12
Grimm	4.98	16
Cossack	4.93	6
Argentine	4.35	7

Based on these and other experiments over the State, as well as general farm experience, the recommended varieties of alfalfa are: Meeker Baltic, Ladak, Hardistan, and Grimm. Meeker Baltic and Grimm, and to a somewhat lesser degree, Ladak, are susceptible to alfalfa wilt, a disease that kills out stands of alfalfa after three or four years in many sections. Hardistan is resistant to this disease

and may be kept in a good stand for at least two years longer than the other varieties. Hardistan is recommended where growers want stands to survive for five years while the other varieties are recommended only for short rotations.

Ladak produces a high percentage of its total yield in the first cutting and is the recommended variety where only one or two cuttings are obtained due to poor water rights or a short growing season.

The term "Colorado Common" is not a particular variety but may be any one of several strains or varieties, some very good and some very bad. Ordinarily no way is available of tracing the source or origin to desirable strains. "Turkestan" alfalfa designates a large number of alfalfas—again, some good and some bad.

Hardistan is a Turkestan strain and carries the wilt-resistant and desirable characters of the better Turkestan alfalfas. "Argentine" may also be variable according to the particular strain or the location where it was produced.

All imported alfalfa or clover seed is required to have a percentage of the seed dyed or stained. "Red" stain typifies in general the seed is from a source or location not considered generally adapted to the alfalfa-growing regions of the United States. "Purple" stain means the seed was grown in similar or more northern climates to that of the United States.

In order to be assured that the alfalfa seed is the variety wanted, has a high purity and germination, and is free from noxious weeds, the purchase of Colorado registered seed is recommended. If this is not available, purchase the best seed of reliable seed dealers or from known desirably yielding fields.

Seedbed Preparation

Alfalfa should not be planted on freshly plowed land unless a lot of work is done in compacting the seedbed or an irrigation given to settle it, or both. More failures in obtaining good stands of alfalfa can ordinarily be attributed to poor, loose seedbeds than to all other factors. A **firm,** level seedbed is the first consideration in planting alfalfa. A **firm** seedbed permits the placing of the alfalfa seed uniformly from one-half to never over one inch in depth. A level field will facilitate irrigation and a uniform stand and growth. Light discing of land that was in a cultivated crop will be easier than plowing and save the extra operations necessary to compact the plowed land. If weeds are not too troublesome, some growers prefer to plant in an undisturbed small-grain stubble, either in the spring or early fall.

Planting Dates and Rates

Ten pounds per acre of good, high-germinating alfalfa seed should be sufficient if planted on a good seedbed. If only 50 percent of the seed survives this would give a stand of over 25 alfalfa plants every square foot. Large quantities of seed per acre will not take the place of a well-prepared seedbed. If it is possible to drill the seed, this is recommended as it puts the seed at a uniform depth. The drill should, however, be set to plant the seed as near to one-half inch deep as possible. At the Colorado Experiment Station in Fort Collins, 10 pounds of drilled seed has produced as good a stand as 15 pounds of seed broadcast.

Spring planting is generally practiced in Colorado, and is recommended. The success of fall plantings in stubble in some sections of the State can be attributed to the firm seedbed and absence of a nurse or competing crop. Fall establishment, however, can be accomplished successfully only where there is sufficient fall irrigation, and seeding is done sufficiently early to get the young plants firmly established before winter. Seeding before September 1 is safest. Fall seeding will result in a lighter crop the following year, than where plants get better established, as in spring seeding.

April is the common month of seeding but successful seeding may be made any time later when water is available. Earlier seedings may be damaged by freezing weather.

The planting of alfalfa without a nurse or companion crop is recommended. Particularly is this true where irrigation water may be short, or where noxious-weed infestations exist in the field to be planted. On weedy land it will likely be necessary to mow the weed growth in 30 to 60 days after planting to let the small alfalfa seedlings get well established, but where a companion or a so-called nurse crop is grown there is entirely too much competition for the small alfalfa and the weed growth may lodge the nurse crop, smothering all the young alfalfa plants.

If a nurse crop is insisted upon it will be much better if every other drill hole is stopped up for the small grain as this permits the alfalfa to get more light and grow better. This practice only reduces the yield of small grains about 10 percent.

Experiments have indicated that companion crops in order of their desirability from the alfalfa standpoint are: (1) Field peas, (2) flax, (3) barley, and last, oats or wheat.

Fertilizers

Alfalfa, while it is a legume and considered as a soil-conserving

crop, if it is sold off the farm, will just as surely deplete the soil as any other crop. It has a high requirement for phosphate and potash, even if it is possible for the bacteria attached to the roots to take the nitrogen requirements of the plant from the air. The soil benefit of alfalfa grown on the farm and in a rotation comes from the added organic matter left in the soil from the decay of the roots when the crop is plowed up and from the production of a desirable feed crop, which, when fed on the farm, makes possible the return to the land of the manure produced.

Barnyard manure, barnyard manure fortified with treble superphosphate, and phosphate alone are the fertilizers which have shown the best results to date in Colorado on alfalfa. Where phosphate is deficient it is recommended that the phosphate be disced or plowed under preceding the planting of alfalfa. One hundred to 150 pounds of treble superphosphate per acre is usually sufficient. If alfalfa follows sugar beets or other crops which were fertilized with manure and phosphate, there will ordinarily be sufficient residual effect of the fertilizer to produce good stands and yields.

Good yields of alfalfa are only obtained on good soils. If your yield is less than 3 tons per acre try strips across your field treated with phosphate, or phosphate and manure, or both, and observe the results. On old stands the phosphate may be incorporated in the soil by renovating.

Renovation of old stands of alfalfa is only recommended where a tight silt deposit from irrigation seals the surface soil or where the surface has been compacted by livestock feeding or pasturing on the fields. In a few cases renovation will destroy some undesirable weeds but when alfalfa gets so thin that weed competition is serious it may be best to plow up the field and replant. Renovation will permit the aeration of the soil and more rapid penetration of water. One-year stands of alfalfa should never be renovated nor should fields infected with alfalfa diseases. Alfalfa renovators or harrows are the best tools to use as discs may injure crowns causing decay and disease spread.

IRRIGATION OF ALFALFA

By FLOYD E. BROWN

In northeastern Colorado rainfall is usually depended upon to germinate the spring seedings while in other sections of the State irrigating-up is usually necessary. Since alfalfa is only seeded at a shallow depth, the surface soil must be kept moist. It is therefore

frequently necessary to irrigate before and after planting. If the surface crusts from either irrigation or a hard rain, light irrigation will soften the crust and permit seedlings to emerge.

One irrigation for each cutting is the common practice for most soils. Usually there is sufficient soil moisture to start the alfalfa growing in the spring, and the first cutting is irrigated when the plants are about 6 inches high. Light, well-drained soil underlain with gravel frequently requires two irrigations for each cutting. Where water is available for fall irrigation, a late irrigation before the soil is frozen is recommended if the soil is dry.

The amount of water applied in each irrigation should depend upon the depth of the soil needing moisture. Six to eight acre-inches per acre for each irrigation is usually an ample amount.

DISEASES OF ALFALFA

By W. J. HENDERSON

Damping-off of alfalfa seedlings may be caused either by seed or soil-borne molds. It may rot the seeds, kill the seedlings before they emerge from the soil, or kill the young seedlings before they are 3 inches tall.

Treating alfalfa seeds with new improved ceresan at the rate of ½ oz. per bushel will help in controlling damping-off of the seedlings.

ALFALFA PESTS

By SAM C. MCCAMPBELL

Special effort should be made to keep the farm free from grasshoppers the season before alfalfa is seeded. Then if this pest attacks, poison with the following bait:

Coarse wheat bran	100 pounds
Liquid sodium arsenite	½ gallon
OR crude white arsenic	
OR paris green	4 pounds
Water to moisten	about 10 gallons

If cutworms attack, use the same bait recommended for grasshoppers. However, it should be scattered broadcast at the rate of 20 pounds per acre about sundown. Grasshopper bait should be scattered about sunup.

Alfalfa Weevil.—Control by spraying with 2 pounds of zinc arsenite in 100 gallons of water at the rate of 100 to 125 gallons per acre. Spray when injury is first noticed, usually about 1 to 2 weeks before first cutting blooms. Equal parts of calcium arsenate and sulfur may be used as a dust instead of the above-recommended liquid spray.

Alfalfa Webworm.—Use same spray as recommended for alfalfa weevil.

Harvesting

Alfalfa at the start of bloom has approximately one-third more digestible nutrients than when it is in full bloom. The full-bloom yield will be only about 5 percent greater than at the start of bloom. The start of bloom then represents the best time to cut alfalfa to get better-quality hay and more actual feed nutrients per acre. Experiments have not indicated a reduction of stands or life of alfalfa plants by such cutting.

The high-protein value of alfalfa hay is mostly in the leaves. Any method which preserves the leaves is recommended in curing and stacking.

After mowing, the hay should be allowed to wilt in the swath and then raked into windrows to cure in more diffused light. Side-delivery rakes will handle hay in a greener state and thus save leaves and other losses. Stacking should be done when the hay is dry enough that it will not "burn" in the stack. Slightly stack-burned hay, while quite palatable to cattle and sheep, has lost all of its vitamin "A" content and possibly some of its protein value.