

MANAGEMENT OPTIONS FOR THINNING ALFALFA STANDS

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Alfalfa "Queen of the Forage Crops", is the most important forage legume grown in the United States. It is widely adapted and is grown over a wide range of soil and climatic conditions. Alfalfa has the highest yield potential and highest feeding value of all adapted perennial forage legumes. It is a versatile crop which can be used for pasture, hay, silage, green-chop, soil improvements and human consumption (sprouts, etc.). As a result of this crops many merits, especially yield, quality and versatile use, it can be used successfully in many animal feeding programs.

Successful alfalfa production requires advanced planning, attention to details and timely operations. Four general objectives should be considered:

- 1) attention to details prior to and during establishment that will result in a thick weedfree stand,
- 2) fertility and pest control during the production phase that will result in high yields,
- 3) timely harvest that results in desired quality and stand persistence,
- 4) marketing the alfalfa through livestock or as a cash crop for profit.

The first major objective in successful alfalfa production is certainly getting a good stand. High yields, high quality and most certainly PROFIT is not possible if we do not have a satisfactory number of plants. Even when we do get that "THICK WEEDFREE STAND" at establishment, we all recognize that our stands are going to thin with age. Table 1 shows typical stand decline with age.

<u>Age</u>	<u>Plants per square foot</u>
60 days	25-40
First year	12-20
Second year	8-12
<u>Third year and after</u>	<u>3-8</u>

Thin, open stands lower yield and invite weed invasion which lowers feed value and marketability.

WHEN SHOULD A STAND BE REPLACED?

I have been asked this question many many times and must admit I always have trouble with general answers. Some logical answers would be: 1) when the stand no longer meets your expectations, 2) when the stand is no longer an alfalfa stand, or 3) when the stand is no longer economical. Let's take a more specific look at these general answers.

When the stand no longer meets your need or expectations. The key word is your. As I visit with alfalfa producers in Kentucky and across the U.S. I find tremendous diversity in programs, needs and demands. Hay producers with specific horse and dairy markets tend to replace stands earlier. Their demands are often for pure stand - high quality - few weeds. This same demand is often observed among dairymen who push their stands with intense cutting management. The cutting management imposed will usually lead to higher quality - more profit but will shorten stand life. Other levels of needs and expectations can be observed among beef or beef-hay producers. During the early years of a stand, it's dominant use may be hay with secondary use as grazing. As the stand ages, the use pattern can be reversed. Demonstration work in Kentucky has shown gains of over 500 lbs of beef per acre from alfalfa stands with less than one plant per square foot.

When it is no longer an alfalfa stand. This answer forces us to define an alfalfa stand and naturally that isn't an easy task. If we use a plant per square foot definition, we would say replace the stand when it's dominant use is hay once the stand count drops below three and below one when the dominant use is for grazing. This type definition creates problems from the expectation prospective discussed above and from the fact that all plants aren't equal. As stands age, the number of crowns decrease but when the remaining crowns are healthy, an increase in number of stems per crown will often help to compensate for the loss of plants.

When it is no longer economical. Research at Missouri and in Kentucky has shown that economic hay yields can be achieved down to an average of three plants per square foot. Research at the University of Kentucky Research and Education Center at Princeton showed hay yields of 5.3 tons/acre with stand counts of 2.8 plants/ft². As mentioned earlier, in some of the alfalfa grazing work, beef gains have exceeded 500 lbs/acre when stand counts average one plant/ft². This question still must be addressed on a personal basis with respect to land quality and availability, production cost, hay and/or beef prices, needs and demands.

OPTIONS

As your alfalfa stand thins, options must be considered. At some point, the option will be to replace the stand. Let's examine some of the management options that we might consider in the year or years prior to replacement.

PEST CONTROL - Weeds, insects and diseases can individually or collectively cause rapid stand loss if not controlled. Weeds are especially serious as stands thin since they compete with the alfalfa plants for light, water and fertilizer nutrients. If competition from weeds is reducing stand, yield or quality considerations should be given to control measures.

FERTILITY - Keeping the alfalfa plant in a healthy, competitive state increases stand longevity. Conversely, if fertility is lacking, alfalfa's growth and competitiveness is reduced. Maintaining soil fertility in an optimum range can have a positive effect on growth and stand persistence.

INTERSEEDING - As alfalfa stands thin, we can select to some extent what plants will occupy the existing space. If left uncontrolled, weeds will occupy that space. Although nothing added can replace the alfalfa plant that was in the original planting, interseeding other plants into thinning alfalfa can increase yield and extend stand life.

Grasses - No-tilling orchardgrass or timothy or endophyte-free fescue or ryegrass into pure stands of alfalfa as stands thin, has been used fairly successfully by many producers. The grass will increase overall production, extend the productive life of the stand, reduce bloat risk and reduce heaving. Grasses are usually seeded immediately after the September harvest is made.

Small Grains - Wheat or other small grain crops can be seeded into alfalfa stands in early fall. Wheat will usually provide more competition during spring. Competition can be reduced by reducing the seeding rate and taking the spring crop off as grazing or silage.

Red Clover - No-tilling or overseeding red clover into thinning alfalfa stands in February or March can increase production and extend the productive life of the stand. A compromise first cutting will be required since the existing alfalfa will be ready for harvest in May and the newly seeded red clover will not be ready until late June. After the compromised first cutting, following cutting or grazing can be made based on need, production and quality of mixture.

Alfalfa - It has been well documented that adding alfalfa seed to old alfalfa stands is a high risk practice. Research has shown autotoxicity and disease to be two major reasons for failures.

If we are dealing with a new seeding that is thinner than desired because of weather factors, we have been successful in going back in and seeding more alfalfa the next seeding period. In other words, if we seeded in late summer, we can thicken the stand some the following spring or if seeded in spring, we could thicken the stand in late summer. Tennessee workers have been successful in thickening a new stand during the next two seeding periods following initial establishment.

CONCLUSION

Alfalfa is the premier forage legume in the U.S. Advances in variety development, establishment, pest control, fertility, harvest and utilization management will permit greater use of alfalfa. Additional research and farmer experience is needed to refine the above and other management options for thinning stands.