

An Exacting Science

Attention to details is essential for establishing a high-yield alfalfa stand.

Story & photos by **Ed Haag**

Editor's Note: This is the third installment of a three-part series exploring when and how to establish a new stand of alfalfa.

If anyone tells you planting alfalfa is a snap, they don't know what they are talking about. "There are a lot of ways you can have a wreck," says Dan Putnam, department of agronomy and range science, University of California, Davis. "You really have to know what you are doing."

This is particularly important considering seed costs. Alfalfa seed can easily cost \$60 an acre, while triticale or other annual grain forages may be \$20 per acre for seed.

Unfortunately, if the alfalfa planting is a failure, the grower is faced with absorbing the cost — equivalent to three years worth of annual seed in a single year.

To avoid this, Dan Undersander, Extension agronomist with the University of Wisconsin, who has participated in forage studies across the country, recommends spending the time to do the research. He notes that every area is different, but there are some fundamentals that must be strictly adhered to — no matter



►Take your first cutting 60 days after seeding.

where the planting is done. This is particularly true of seeding depth and firmness of the seedbed — two factors that, if not addressed properly, can lead to the loss of a stand.

Planting dates

Experts agree that planting dates will depend on a variety of factors. These factors can range from weed competition to when the previous crop was harvested. For Undersander, the most important consideration when deciding on a planting date is making sure there is enough moisture in the soil to carry a newly seeded stand through the establishment period.

Because of this moisture factor, most alfalfa in the northern region is seeded in the spring. For example, in Minnesota, most alfalfa planting takes place from April 15, in the southern part of the state, to May 30 in the northern part.

"Through a lot of the northern states, spring [planting] is favored because you can depend on it being cool and wet," Undersander says. "That prevents the seed from drying out in the shallow surface."

He notes that irrigated sites do have a distinct advantage over nonirrigated sites in terms of days available for seeding. "Under irrigation, you don't have to worry about the soil surface drying out," Undersander says. "Even in northern states, you have a much broader planting window."

Putnam says the best time to plant alfalfa in the southern states can vary dramatically from one region to the next, depending on soil moisture and climatic conditions. For example, in the nation's top alfalfa-producing state — California — seeding dates can begin in February and extend through

October, depending on the location. To determine the best seeding dates in a specific region, Putnam recommends contacting a local Extension educator.

Seed inoculation

Because there is no guarantee that *Rhizobium meliloti* — the nitrogen-fixing bacteria that adhere to alfalfa's root system — is present in the soil, Undersander always recommends purchasing seed that has been coated with the bacteria.

He warns that the inoculant is usually effective for less than 12 months, and seed left over from last year should be reinoculated. This can easily be accomplished by purchasing powdered inoculant and mixing with water according to label directions. The coating process can be done by pouring the seed from one 5-gallon (gal.) bucket to another or mixing in a cement mixer. When completed, the alfalfa seed should be evenly coated with the inoculant.

Seeding rates

One way to calculate the seeding rate, Undersander says, is to start with the knowledge that every pound of seed used averages out to five to six seeds per square foot (sq. ft.).

"We would like to see 30 plants per square foot, so that only takes about 5 or 6 pounds (lb.)," he says, noting that most recommended seeding rates run 12 lb. per acre. "That is twice the minimum and definitely enough to get a good stand."

He adds that California, where the seeding rates for nondormant varieties run 20 to 30 lb. per acre, is the exception.

When calculating the seeding rate for an alfalfa-grass mix, Undersander recommends cutting the alfalfa seed back one-third to 8 lb. per acre, then adding the weight of



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grass seed appropriate to its type. He points out that because of the variation in size and density of their seeds, each type of grass needs a different weight of seed to make up a two-thirds-alfalfa, one-third-grass mix. "For example, 8 pounds of alfalfa require 2 to 4 pounds of timothy, or 4 to 6 pounds of orchard grass, or 6 to 7 pounds of broomgrass," Undersander says.

Seedbed preparation

Seeding cannot be accomplished in an effective manner without preparing a proper seedbed first. Seedbed conditions are critical to ensure proper germination and plant development. Later, they have a direct effect on yields and hay quality. Undersander recommends working toward building a firm, flat and uniform seedbed that allows for good soil-to-seed contact.

"The first task is to level the field," he says. "When you have a smooth field, you can cut shorter, and your yield is higher."

He notes that as long as you have a smooth, firm surface, a variety of systems can be used, including no-till. A good rule of thumb for determining the right seedbed firmness is that a bootprint should not make an indentation of more than a ½ inch (in.). "If you seed it into a loose soil, you don't get good seed-to-soil contact," Undersander says. "Without that contact, seeds can't take up the water they need to start germinating."

Seeding alfalfa

For Undersander, another key factor in establishing a successful alfalfa stand is seed placement. He says one good method is using a precision drill that is capable of placing the seed ¼ to ½ in. below the surface.

"This is where I see most stand failures," he says. "If you go too deep, the seed does not have enough resources to make it to the surface."

Finally, Undersander says it is important to cover the drilled seed with a thin layer of packed soil to hold in the moisture and prevent the seeds from washing or blowing away. For this, he recommends a drill followed by press wheels or a cultipacker.

Undersander says there are several other methods that can be used to accurately place the seed and pack the soil. Some of these are quite innovative.

"In regions of Illinois and Iowa, the seed is actually applied with a liquid fertilizer spreader, along with the P (phosphorus) and the K (potassium)," he says. "Then you press the seed into the soil with a cultipacker."



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Seeding alfalfa-grass mix

The size and weight of individual grass seeds play an important part in determining how an alfalfa-grass mix is planted, Undersander says. For example, timothy seed is approximately the same size and weight as alfalfa seed, so the two can be mixed in the same box and sown together.

"On the other hand, if you are seeding broomgrass, which has a large, light, fluffy seed, you need to put the grass seed in the grass box and the alfalfa seed in the legume box," Undersander says. "It is either that or make two separate passes over the field."

Early weed control important

Alfalfa seedlings are very susceptible to competition from weeds during their first 60 days. Unless weeds are controlled during that period, they can cause stand thinning and greatly reduce the lifetime yield of the alfalfa crop, Undersander says. For straight alfalfa stands, there are a variety of options, including pre-emergence and postemergence

herbicides, that will effectively reduce or eliminate weed competition without harming young alfalfa seedlings.

"With the postemergence herbicides, you go over with a spray boom, usually when the alfalfa has about five leaves," he says.

Undersander suggests checking with a local Extension agronomist to determine which control agents are available in a particular state.

One of the limitations of planting an alfalfa-grass mix is the limited number of resources available to deal with weed competition. "Because you have a legume and a grass, you really don't have any herbicides you can use," Undersander says.

To help deal with this problem in a mixed stand, he suggests planting a fast-growing cover crop to out-compete the weeds. "We are talking about a few pounds of Italian ryegrass, or 1 bushel per acre of oats, barley or triticale," he says. "We need something that will come up real fast, keep the weeds down, and you will take that off as a silage or hay."

Undersander warns that if the intent is to graze off the nurse crop, the alfalfa plants should be at least 8 in. tall. This height will ensure the alfalfa plants have developed the anchors necessary to prevent cattle from pulling them out of the ground.

Insect control

The insect pest to watch out for in new alfalfa stands is the potato leafhopper, Undersander says. He recommends planting available resistant varieties accompanied by an aggressive scouting program.



Tips for maintaining a vigorous stand

No one wants to go to the expense and trouble of replacing an alfalfa stand if it can be avoided. Here are some simple maintenance tips that can help you keep your alfalfa stand economically viable longer.

1. Cut 60 days after seeding, then 40-45 days after that, when the plant is in the 10% bloom stage.
2. Scouting is an important part of alfalfa production. Catching pests early can prevent major stand damage and extend the life of a stand.
3. When harvesting alfalfa, make sure the equipment is in good order. This will result in clean-cut stems that are less likely to fall prey to pests and diseases. Be sure to cut 1.5 inches (in.) to 3 in. above the crown buds.
4. Once the alfalfa is cut and dried, bale and remove it as soon as possible. The sooner the regrowth begins, the less stress there is on the stand. This is especially true for irrigated alfalfa, where plants can become stressed from drought during the harvest period.
5. The more intensely managed a stand is, the more likely it will require annual top-dressing to replace the nutrients lost to hay production. Test for phosphorus (P) and potassium (K) regularly.
6. In the Northeast and Midwest, do not cut between Sept. 1 and Oct. 15. This will prevent the alfalfa plants from trying to re-establish their canopy at the expense of their root reserves. A stand can be cut after Oct. 15. By then the soil is cool enough to inhibit significant regrowth, thus preserving the root reserves the plant needs to survive the winter.