

ALFALFA SEEDING AND MANAGEMENT TIPS

FROM LANGDON BROS.

AUTOTOXICITY: Alfalfa plants produce a toxin that can reduce germination and growth of new alfalfa seedlings. This phenomenon is known as autotoxicity. The extent of the toxin's influence increases with the age and density of the previous stand and the amount of residue incorporated prior to seeding. The autotoxic compound, medicarpin, is water soluble and is concentrated mainly in the leaves. A waiting period after destroying the old stand is necessary to allow this toxic compound to degrade or move out of the root zone of the new seedlings. Breakdown is more rapid under warm, moist soil conditions. Ideally, grow a different crop for one season after plowing down or chemically killing a 2-year or older stand before seeding alfalfa again in the same field. This is the best and safest way to manage new seedlings of alfalfa.

PREVIOUS CROP: Check your records to see what herbicides were applied to the previous crop to control weeds. If the previous crop was corn or soybeans there is a good chance that herbicide carryover could prevent you from seeding alfalfa until an allotted amount of time has passed to be safe. If your soil pH is above 7.0 the carryover period could even be longer. Please check the records.

TEST THE SOIL: Treat to an ideal pH of 6.8-7.0. Set your yield goal and apply phosphate, potash and boron requirements accordingly. A good starter fertilizer is 8-26-26 or a blend similar.

IMPROVE DRAINAGE: Field drainage should be good because even the most disease resistant alfalfa won't survive in standing water very long.

VARIETY, TREATMENT, AND INOCULATION: It is very important to choose the alfalfa variety that best fits your needs or situation. Whether it's the least expensive alfalfa variety such as Vernal for 1 or 2 years or a disease resistant, high yielding variety like Paramount for maximum production. We feel that the proper seed treatment fungicide and inoculation are very important to establish an alfalfa stand. You will get treated and inoculated alfalfa seed at Langdon Bros.

WHEN TO SEED: Many older farmer remember seeding alfalfa in March with great success, but we feel times and weather have changed. Alfalfa can freeze out when first getting established, so we recommend waiting until mid April or the first of May before seeding alfalfa. From the middle of April through the middle of May has been the best seeding time in central Indiana for the past several years. We have had several customers lose stands planted in March. In the fall begin seeding in early to mid August and try to finish by September 15th as a rule.

SEEDING: Drill 1/4" - 1/2" deep in a firm, well prepared seedbed. If seeding with grasses, use separate or divided planter boxes. If broadcast alone or with fertilizer or other forage seeds, always set broadcaster on 1/2 rate and double spread the field. After broadcasting the seed on a tilled field use a cultimulcher or harrow to firm the seed and soil together. If no-tilling make sure you don't place the seed too deep. Drilling the field twice at 1/2 rate is sometimes used if the drill does not have a grass seed box. Always remember, you need warm soil, sufficient moisture and good seed to soil contact.

SCHEDULE YOUR HARVESTS: for maximum protein and persistence. First year, take first cut after full bloom, remaining cuts at approx. 4-5 week intervals. Older stands, take first cut at early bloom, remaining cuts at approx. 4-5 week intervals when dry weather doesn't restrict regrowth.

MAINTAIN HIGH FERTILITY: Topdress as needed throughout the life of the stand. Every ton of dry alfalfa yield takes off 14 units of phosphorus and 50 units of potash. For example, after the 1st cutting each year you could apply 150-200#/acre of 0-14-42 plus 1-2#/acre of Boron. After the last cutting or in the fall you could apply 200-300#/acre of 0-14-42, no Boron needed this time. Boron helps increase the yield and quality of alfalfa. Boron also affects the carbon and nitrogen related to alfalfa production.

CONTROL WEEDS AND INSECTS: Helps prevent needless yield losses and maintain forage quality. Sometimes cutting the alfalfa at the right time can prevent the need for costly herbicides and insecticides. Monitor your field closely.

WINTERIZE YOUR STANDS: Always allow at least 5-6 weeks between last full cutting and normal date of first killing frost to allow plant to build sufficient root reserves. Last cutting by September 1st.

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1-800-526-4366

ALFALFA MANAGEMENT

Apply lime before seeding

Liming is the single most important fertility concern for establishing and maintaining high yielding, high quality alfalfa stands. Benefits of liming alfalfa include:

- increased stand establishment and persistence,
- more activity of nitrogen-fixing *Rhizobium* bacteria,
- added calcium and magnesium,
- improved soil structure and tilth,
- increased availability of phosphorus and molybdenum (figure 1) and
- decreased manganese, iron and aluminum toxicity (figure 1).

For maximum returns, lime fields to at least pH 6.7 to 6.9. Field trials performed in southwestern Wisconsin show that yields drop sharply when soil pH falls below 6.7 (figure 2).

Because lime reacts very slowly with soil acids, it should be applied 12 months – preferably longer – before seeding. For typical 4- to 6-year crop rotations, the best time to apply the recommended amount of lime is when coming out of alfalfa. This allows more time for reaction with the soil. The accompanying tillage for rotation crops may result in two or three remixings of the lime with the soil. This should raise the pH to the desired level by the time alfalfa is replanted.

Figure 1. Available nutrients in relation to pH.

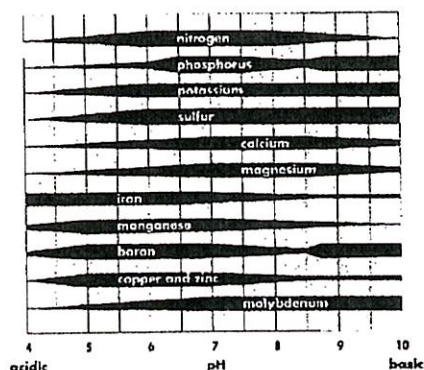
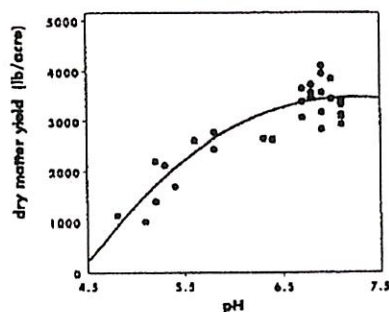
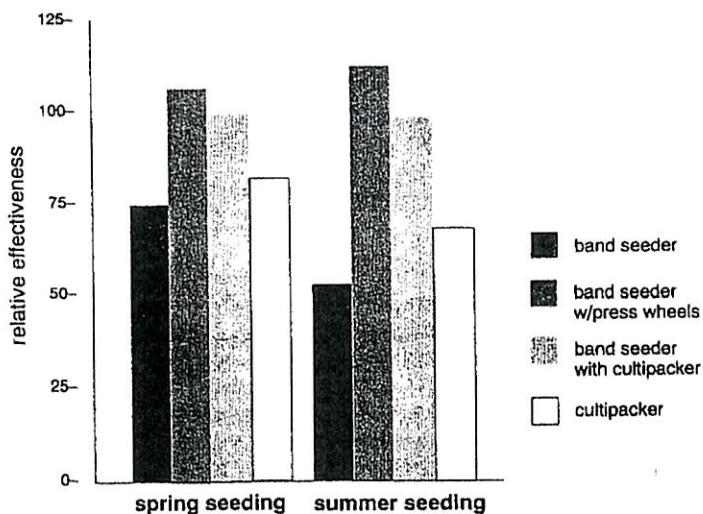


Figure 2. First-cutting alfalfa yield relative to soil pH.



Source: Wollenhaupt and Undersander, University of Wisconsin, 1991

Figure 12. Comparison of seeders for stand establishment.



Source: Tesar, Michigan State University, 1984

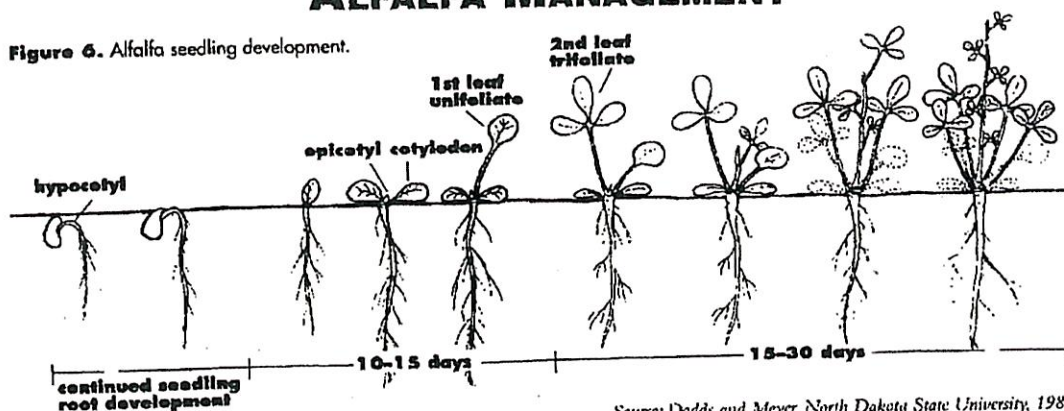
Spring seeding of alfalfa can begin as soon as the potential for damage from spring frosts has passed. At emergence, alfalfa is extremely cold tolerant. At second trifoliate leaf stage (figure 6) seedlings become more susceptible to cold injury and may be killed by four or more hours at 26°F or lower temperatures. Alfalfa seeded with a companion crop survives lower temperatures and longer exposure times before showing frost damage. Frost damage is usually not a problem by the time farmers can get fields tilled in the spring and ready to seed. Early seedings have less weed competition and less moisture stress during germination because of cooler temperatures.

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Figure 6. Alfalfa seedling development.



Source: Dadds and Meyer, North Dakota State University, 1984

Cutting schedule

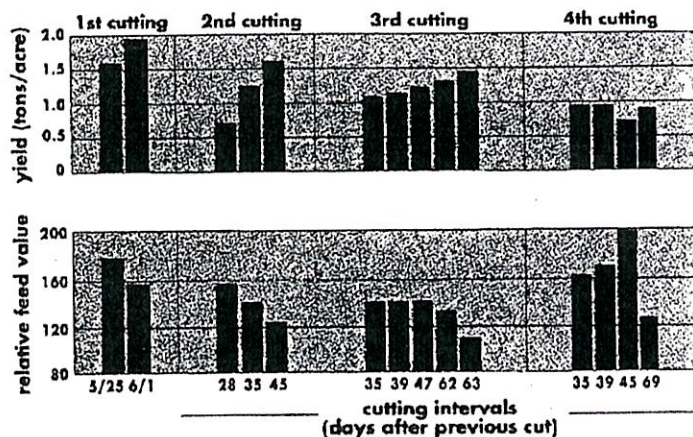
Selection of a harvest schedule begins with the decision on quality of forage desired. Growers desiring all high quality alfalfa will shorten stand persistence and decrease yield. Harvest schedule decisions include number of cuts per season, date of cut, stage of maturity, interval between cuts, and cutting height. The link between the stage of maturity and yield, quality, and persistence makes it apparent why growth stage is frequently used to decide when to harvest alfalfa. Keying harvests to specific stages of development also takes into account the varying effects of changing environments and variety maturity rates. A shortened growing season in northern states dictates combining calendar dates and stage of development into harvest strategies.

Maximum persistence. If harvesting for maximum persistence, cut alfalfa between first flower and 25% flower. This is approximately 35 to 40 days between cuttings (fig. 17). The system has a slightly wider harvest window and longer cutting interval than when cutting for high quality because the emphasis is on high yield.

High yield and high quality. For harvest schedules to provide the highest yield of high quality forage, the first two cuttings must be timely. During this time forage quality changes most rapidly and short delays mean low quality forage (fig. 18). Take the first cutting at bud stage or between May 15 and 25 in Minnesota and Wisconsin, and earlier farther south.

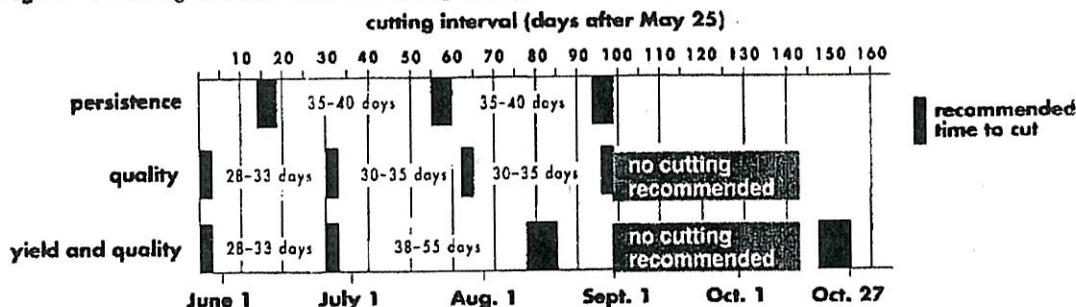
Take the second cutting 28 to 33 days after the first cut or midbud, whichever is earlier, and take subsequent cuttings at 38- to 55-day intervals or at 10 to 25% bloom. An early first harvest followed by a short cutting interval gives a high yield of quality forage (fig. 17) while letting one cutting mature to early flower will increase root reserves and stand persistence. The forage quality of alfalfa does not change as rapidly in later cuttings as in earlier cuttings so later cuttings maintain quality to later maturity stages (fig. 18). This slower quality change allows a harvest window of 7 to 10 days. Additional cuttings may be taken if time permits before the required 6- to 8-week rest prior to the first killing frost.

Figure 18. Dry matter yields increase with longer intervals between cuttings while forage quality rapidly declines, particularly during first and second cuttings.



Source: Adapted from Brink and Marten, University of Minnesota, 1989

Figure 17. Cutting schedules for different management goals.

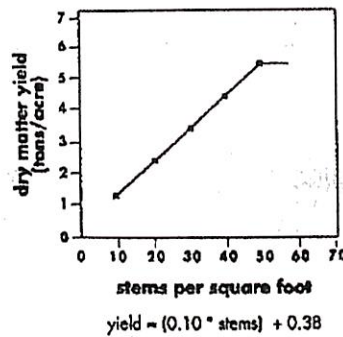


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Alfalfa stem count and yield potential.

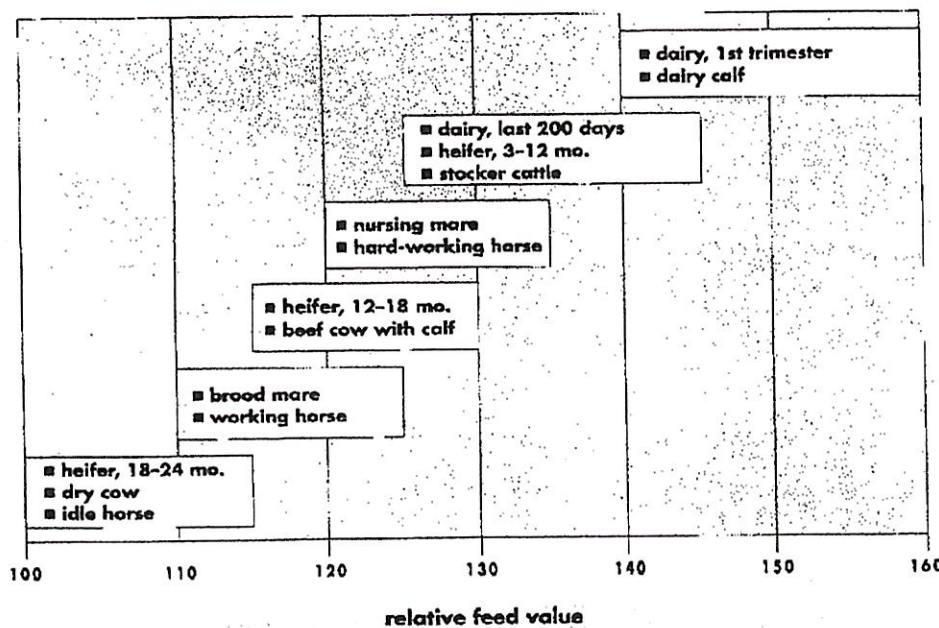


Source: Undersander and Cosgrove, University of Wisconsin, 1992

Forage Quality

Alfalfa is superior to other forage crops because it is high in crude protein and energy, reducing the need for both type of supplements in rations. The superior intake potential allows for greater use in rations of high-producing dairy cows.

Figure 14. Forage quality needs of cattle and horses.



What quality forage is needed?

The nutrient need of an animal depends primarily on its age, sex, and production status (fig. 14). Maximum profit results from matching forage quality to animal needs. Lower-than-optimum quality results either in reduced animal performance or increased supplement costs. Conversely, feeding animals higher quality forage than they need wastes unused nutrients that were expensive to produce and may result in animal health problems.

Table 10. Economic thresholds for alfalfa weevil larvae in early bud stage alfalfa.

control cost \$/acre	forage value (\$/ton)							
	45	55	65	75	85	95	105	115
	average larvae/stem							
7	4.0	3.3	2.8	2.4	2.2	1.9	1.8	1.6
8	4.6	3.6	3.2	2.7	2.4	2.2	2.0	1.8
9	5.2	4.2	3.6	3.1	2.7	2.5	2.2	2.0
10	5.8	4.7	4.0	3.4	3.0	2.7	2.5	2.2
11	6.3	5.2	4.4	3.8	3.4	3.0	2.7	2.5
12	6.9	5.6	4.8	4.2	3.7	3.3	3.0	2.7
13	7.4	6.1	5.2	4.5	3.9	3.5	3.2	2.9

Source: Peterson, Danielson, and Higley, University of Nebraska, 1993

Insect Management

Alfalfa weevil. Alfalfa weevil larvae chew and skeletonize leaves. Large larval populations may defoliate entire plants, giving the field a grayish color. Damage normally only occurs to the first harvest but both larvae and adults may damage regrowth when populations are high, resulting in both yield and stand loss.

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