# USDA-ARS

# **Recommendations for Interseeding Alfalfa into Silage Corn**

## John Grabber, USDFRC; Dan Smith, Mark Renz, University of Wisconsin-Madison

E stablishment of alfalfa by interseeding into corn has the potential to double 1<sup>st</sup> year yields of alfalfa, increase overall forage yields and profitability of corn silage-alfalfa rotations, and decrease soil and nutrient loss from cropland. Over the last decade, scientists at the USDA-Agricultural Research Service, the University of Wisconsin, and other institutions have been developing reliable methods for establishing alfalfa in high-yielding silage corn. Based on this work, the following represents our current recommendations for implementing this practice on farms.



#### Field characteristics and soil fertility.

The site must be suitable for good alfalfa production, with a soil pH of 6.6 or greater, and good drainage. Avoid fields that are routinely wet and easily rutted during corn silage harvest. The seedbed must be smooth, firm, and free of excessive residues that would interfere with drilling alfalfa after corn planting.

To ensure good corn establishment, apply a starter fertilizer at planting to provide 40-20-20 lbs per acre of N,  $P_2O_5$ , and  $K_2O$  in a 2x2 placement. Total available N from commercial fertilizer and manure should be at the upper end of recommended rates for corn silage. Farmers should be prepared to sidedress corn with additional N, particularly if lower rates of available N are applied at planting or if excessive rainfall causes N deficiency in corn. Based on soil tests, apply phosphorus, potassium, boron, and sulfur levels to meet nutrient needs of both corn silage and 1<sup>st</sup> year (seeding-year) alfalfa.

### Proper timing for corn planting and alfalfa interseeding.

To balance competition between the crops, farmers must consider initial growth conditions when planting corn and interseeding alfalfa. If corn is planted early and minimum soil temperatures are below 50°F (e.g., prior to May 8 in southern Wisconsin or May 15 in northern Wisconsin), interseeding should be delayed until the corn V1 stage to lessen competition from alfalfa. Warmer conditions favor germination and growth of corn, therefore, late-planted corn should be interseeded within 3 days to allow alfalfa sufficient time to grow before corn canopy closure. Don't interseed if the soil profile is extremely dry and rainfall is not expected after planting. Under these conditions, alfalfa will either establish unevenly or compete excessively with corn for soil moisture. If spring rainfall is adequate, later-season dry periods are generally not a concern because interseeded alfalfa improves rainfall infiltration into soil and should improve water availability for both crops.

### Corn silage hybrid, seeding rate, and harvest.

The corn hybrid should have good to excellent scores for agronomic traits. Use an early to mid-season hybrid for an anticipated harvest by mid-September to allow interseeded alfalfa adequate time to prepare for winter. To provide a good balance between satisfactory alfalfa establishment and good corn silage yields, plant corn to provide a final population of 28,000-32,000 plants/ac. Harvest corn at the proper moisture for ensiling, but if possible avoid harvesting if fields are wet and easily rutted. As with any crop production system, aim to minimize soil compaction at harvest by using machinery equipped with low-pressure tires and low axel weights and limit the proportion of cropland subjected to wheel traffic.

### Alfalfa establishment.

A drill with press wheels should be used to plant 16 lbs/ac of alfalfa on a live seed basis at a ¼-½" depth in the corn interrow area. If interseeded within 3 days of corn planting, alfalfa can also be drilled over or across corn rows if care is taken to ensure germinating corn is not disturbed. To maximize forage yield of alfalfa following corn, row

spacing for alfalfa should not exceed 10". Seeders that rely on corrugated rollers to incorporate surface broadcast seed will generally not provide adequate establishment of alfalfa in this system. Previous studies in Wisconsin have shown good success with the following alfalfa varieties: 55H94, 55H96, 315LH, Magnagraze II, Magnum Salt, Hybriforce 3400, Hybriforce 3420, 54Q14, 55V50, FSG403LR, FSG329, Spredor 5, WL359RR.LH, RR Vamoose, and FSG430RR.LH. Seeding an untested variety may result in poor alfalfa establishment under corn. Alfalfa varieties with high resistance to Aphanomyces (race 2) should be used in areas where this disease is common. Low lignin or "high-quality" alfalfa varieties are currently not recommended because the evaluated varieties have not performed well in this system.

#### Agrichemical treatments.

For weed control, we recommend applying Warrant after planting and just after alfalfa emergence as a PRE herbicide. POST weed control will vary depending on the alfalfa variety and corn hybrid used. For RR systems, glyphosate is highly effective when weeds are 4-6" tall, and our experience suggests only one application is needed. If conventional alfalfa or corn is planted, we recommend bromoxynil (many generics available; we use Moxy 2E) applied when broadleaf weeds are 1-2" tall and after alfalfa has 4 trifoliate leaves. Follow all pesticide label restrictions; the label is the law.

Establishment of interseeded alfalfa is enhanced by an application of Kudos (prohexadione-calcium), a plant growth regulator that has just been registered for this use in Pennsylvania and Wisconsin. Initial topgrowth of interseeded alfalfa usually dies back prematurely due to heavy foliar disease and potato leafhopper pressure so alfalfa should be treated with a fungicide and, if needed, an insecticide to optimize its survival under the corn silage canopy. We will discuss the use of these agrichemicals in a future article after we further optimize their application rates and timing for interseeded alfalfa. In ongoing work, we will identify corn hybrids that are best suited for interseeding and will further refine management practices to ensure interseeded alfalfa production systems will be reliable, high-yielding, and profitable for farmers.

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