

MONTANA GUIDE

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AGRICULTURE

Alfalfa Variety Selection

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Alfalfa—the most productive and most widely adapted forage species—is indeed “Queen of the Forages.” A grower’s initial decision to produce alfalfa and subsequent choice of varieties have long-term consequences. There are over 200 alfalfa varieties available in the northern USA and Canada, and this number increases by 30 to 40 new varieties each year.

Alfalfa varieties should be chosen on the basis of winter hardiness, yield potential, pest resistance, persistence, forage quality and availability. Montana has variety performance trials in major irrigated and dryland hay production areas. Performance summaries are published annually and are available to Extension agents, growers and seed companies. “Recommended” varieties have been widely tested in Montana for a minimum of three years at four locations. Obviously, local information should be used by growers to narrow down the list of potential varieties. The final step is to choose a reputable local seed supplier. In most cases, the seed companies have a complete lineup of alfalfa varieties, as well as additional performance information and recommendations.

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Winter hardiness

In most areas of the northern US and Canada, winter hardiness is the key factor influencing stand longevity and forage yield. Alfalfa varieties are classified depending upon how rapidly they become dormant in late summer. Early fall-dormant varieties are more winter-hardy than nondormant varieties; thus earliness of fall dormancy has historically been used as a measure of winter hardiness.

Very dormant varieties (fall dormancy class 1) such as ‘Ladak 65’ have heavy first cut yields but have very little fall growth. Very nondormant varieties (fall dormancy class 9) produced in the desert southwestern USA continue growth late into the fall and can be harvested nine or ten times per year. Varieties in fall dormancy classes 1 through 4 are suitable for production in Montana. On large farms, it is advisable to split acreage between varieties differing in fall dormancy. Less dormant varieties generally have faster recovery and higher yield potential, but are more susceptible to winter injury. The more dormant varieties typically mature later, but persist better for long-term stands.

Forage yield

Forage yield is probably the most important factor considered by an alfalfa grower or seed marketer. In Montana and other regions with

cold winters, forage yield potential is restricted by both the climate and a variety's level of winter hardiness. For example, in moderate or hot climates, nondormant varieties can outyield very dormant varieties by 75 to 100 percent. In contrast, the range in forage production of high vs. low yielding dormant varieties is typically less than 25 percent in Montana. Nondormant varieties can outyield dormant varieties in the seeding year in cold environments, but because of winterkill, they are considered to be "annuals." Alfalfa breeders constantly struggle to improve forage yield potential while maintaining adequate winter hardiness.

Extension agents and growers should be acquainted with alfalfa variety trials in their own region. Data from several replicated trials evaluated for at least three years should be examined. Actual forage yields are often misleading, but relative differences between varieties are very reliable. Although most growers are unfamiliar with statistics, they can easily look for the "least significant difference" (or LSD). This test statistic provides a yardstick for comparing variety performance in a yield trial. Variety averages that differ by one LSD unit are statistically and significantly different. Typically, when yields are ranked from highest to lowest, up to a third of the varieties are not statistically different from the best entry. Obviously varieties that consistently perform well in several replicated trials should be chosen.

Pest resistance

Pest resistance is also important when selecting an alfalfa variety. Over 50 disease, insect or nematode pests affect alfalfa but losses can be prevented by using resistant varieties. For irrigated alfalfa production in Montana, varieties should have good levels of resistance to bacterial wilt, Verticillium wilt, Fusarium wilt, Phytophthora root rot, and stem nematode. Alfalfa varieties are cross-pollinated populations with varying degrees of genetic resistance to pests. Varieties are classified according to the percentage of plants resistant to a particular pest: highly resistant (more than 50 percent), resistant (31–50 percent), moderately resistant (15–30 percent), low resistance (6–14 percent), and susceptible (0–5 percent). For most pests, it has been determined that about 40 percent resistant plants provides adequate field protection. Most alfalfa breeding programs breed for multiple pest resis-

tance. A variety should have adequate resistance to all major and potential pest problems, rather than high resistance to some pests and susceptibility to others. Among varieties with proper winter hardiness and good forage yield potential, a grower should choose varieties with the best package of multiple pest resistance.

Persistence

Aside from known differences in winter hardiness and pest resistance, some varieties differ in persistence. In short rotations, high-yielding and moderately winter-hardy alfalfa varieties should be chosen. Growers concerned with stand longevity should examine performance in yield trials evaluated into the third and fourth production years. Suitable varieties often perform well or average during the first two years but become even more competitive in subsequent years.

Forage quality

There is currently much interest in developing and selecting alfalfa varieties for improved forage quality. Several companies have released "high quality" (HQ) or multifoliolate (ML) varieties, and these reportedly represent improvements in forage quality. Alfalfa growers supplying hay to dairies or other markets based on hay analysis know that premium hay is very valuable. High quality alfalfa varieties will not overcome poor management practices or weather; however, under good conditions, these varieties will be profitable. Within the next five years, it is likely that university trials will publish both forage quality and yield information. It is also likely that new ML, HQ, or ML-HQ varieties will have significant improvements in forage quality as well as good yield, pest resistance and winter hardiness.

Public vs. proprietary varieties

Prior to 1970, most alfalfa acreage was seeded to varieties developed by state or federal agencies ("public varieties"). During the 1970s, private research programs expanded for major crops such as corn, soybean, cotton and alfalfa to release "proprietary" varieties. Presently there are about 15 companies actively breeding alfalfa or producing seed. Alfalfa seed is a multimillion dollar industry, and the commercial programs in North America invest heavily in research. About 95 percent of the alfalfa varieties released since 1980 are proprietary varieties and this trend will likely continue.

The older common or public varieties are still available in the West and remain popular in some areas. Under certain conditions such as drought or in old pastures, many of the older varieties perform as well as modern varieties. However, reliable sources of high quality seed of the older varieties are not widely available. In spite of efforts to maintain genetic purity and certification standards, many older alfalfa varieties are now extinct.

Seed of newer proprietary varieties is generally considered expensive. However, depending on seeding rate and stand life, seed costs account for less than 5 percent of grower input costs. An improved, high-yielding alfalfa variety will usually offset any higher initial seed costs during the first production year. Cost-conscious growers might consider planting a premium variety in their best fields for top production, and less expensive older varieties in poorer fields or pastures.

Summary

Many factors should be considered by a grower prior to selecting an alfalfa variety. Producers who use alfalfa for hay or pasture often face a hay deficit and rely on purchased hay. Depending on the type of livestock, size of operation, equipment, land value, moisture, etc. there are many ways alfalfa can improve efficiency.

Grass pastures with adequate rainfall can be renovated, and a winter-hardy, pasture-type alfalfa can be established. Marginal older hay fields could be rotated out, and replaced with an improved variety. In some beef operations, cash flow has been improved by producing and selling premium cash hay, then buying back cheaper feeder-grade hay.

Alfalfa producers desiring to sell cash hay should consider joining or forming a hay marketing association (see MontGuide 9208 "Targeting Specialized Hay Markets"). Several marketing associations in the West sell alfalfa hay throughout North America and overseas. The commercial hay market is becoming more sophisticated in terms of quality testing, moisture, physical appearance and storage conditions. Therefore, a grower should anticipate using the best alfalfa varieties and intensive management techniques (see MontGuide 8505 "Growing Alfalfa for Hay"). An alfalfa variety should be selected based on its winter hardiness, yield potential, pest resistance, persistence, forage quality and availability. Although there are over 200 alfalfa varieties available, very few have been widely tested in Montana. Growers are advised to choose varieties that are recommended each year by the Montana State University Extension Service.

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