

# alfalfa fact sheet

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How to select and manage your alfalfa stand for  
quality, quantity, and longevity

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With few exceptions, such as high acidity soils, alfalfa is well adapted to the Bulkley-Nechako and Fraser-Fort George (BNFFG) regions. A soil test is recommended to ensure conditions are suitable for successful establishment and growth of alfalfa. As the forage species with the most varieties developed, the selected traits and characteristics vary considerably. Thoroughly understand all the characteristics of the alfalfa variety purchased to ensure it meets all your needs for your site and situation.

### Opportunities

- If inoculated with the correct bacteria, alfalfa fixes atmospheric nitrogen for its own growth and leaves some behind in the soil.
- In a hay or pasture mix, alfalfa adds valuable nutritional quality by increasing protein content.
- The extensive root system of tap and spreading rooted varieties supports healthy soils.
- A wide selection of varieties offers many adaptations.

### Challenges

- Alfalfa can cause frothy bloat in ruminants if consumed in large quantities and/or when conditions allow for rapid breakdown of plant material, such as when plants are young, lush, and moist.
- Alfalfa tends to thin out and disappear from mixed stands over time. Although alfalfa can re-seed itself, it cannot immediately grow in the same spot a plant previously grew due to allelopathy.
- Alfalfa does not like to have “wet feet” and is intolerant of waterlogged soils.
- Winterkill can be an issue, requiring no or minimal cutting or grazing during the six weeks prior to first frost.

## queen of forages

**Alfalfa (*Medicago sativa*) is the queen of forages and is the most widely used perennial legume with the largest selection of varieties.**

## good to know

**Alfalfa varieties originate from two types: Flemish type alfalfa (*Medicago sativa*) which is purple flowered and thought to have originated in the Middle East, and Siberian type alfalfa (*Medicago falcata*) which is yellow flowered and originated in more northern climates. True falcata alfalfa is not currently available on the market. Instead, there are crosses that were made between *M. sativa* and *M. falcata* to produce the yellow flowered types currently available on the market. These are subspecies like *Medicago sativa ssp. falcata* and *M. sativa ssp. varia* which contain germplasm from both the Flemish and Siberian type alfalfa.**



Photo credit: [alfalfapartners.com](http://alfalfapartners.com)

## choosing a variety

When choosing an alfalfa variety, you will have an abundance of choices. Forage yield is often a selection criterion and new varieties may claim increases of 5-10% compared to check varieties. Although yield is an important consideration, it should not come at the expense of winter hardiness in the BNFFG regions.

**Fall dormancy** is the ability of alfalfa to grow in the fall. It is determined by clipping alfalfa 25-30 days before the first killing frost and measuring the height of regrowth prior to that frost. Fall dormancy classes range from 1 through 11 and should be available on variety spec sheets, in seed guides, or from your seed dealer.

Fall dormancy used to be the sole description of alfalfa **winter hardiness**. Fall dormancy ratings are now used in conjunction with winter survival ratings. Winter survival is a broader term and includes physiological and other factors that can injure or kill alfalfa. For fall dormancy ratings of 2 to 5, the relationship between winter hardiness and fall dormancy has been broken. This means that you could select an alfalfa variety with a fall dormancy of 5 which may also be classified as very winter-hardy (a score of 2 for winter hardiness).

When selecting alfalfa, choose the least fall-dormant variety that will survive winter at your location while providing the most yield. Although it may be tempting to go with less fall dormant varieties, especially if they score well on winter hardiness, the ultimate test will be the on-the-ground survival and injury rate you experience. With greater extremes of temperature projected with climate change, leaning on the side of stronger fall-dormancy and higher winter hardiness ratings can safeguard against premature winter kill and winter injury.

**Don't forget about disease resistance:** Know the disease risk on your farm and select varieties with resistance to as many of them as possible. Examples of alfalfa diseases which may occur in the BNFFG region include: various root rots such as aphanomyces, phytophthora and brown root rot, crown rot, spring black stem, blossom blight, and verticillium wilt. Observe disease maps where available, monitor your fields for any new diseases that

may become an issue in your area, and consult with a qualified agronomist.

**Seed Inoculation:** Inoculant strains should match the variety of alfalfa. Alfalfa is generally inoculated with Rhizobium bacteria. Inoculated seed will be marked with an expiration date and seed that has been stored beyond this date should be re-inoculated prior to seeding.

**Fertility management:** As with any forage crop, test your soil prior to the new forage being established to determine the fertility needs. Seek support from a forage agronomist if you need help interpreting the soil test results. Note that high nitrogen rates will discourage nitrogen fixing performance. Alfalfa fertility should instead focus on adequate supplies of phosphorus, potassium, sulfur, and micronutrients like calcium. In mixed stands, where alfalfa makes up over 50% of the forage stand, fertilization should focus on the legume component and contain only minimal nitrogen fertilization.

**Managing Allelopathy or Autotoxicity in Alfalfa:** Alfalfa should not be planted on top of alfalfa as autotoxicity, a toxicity to itself, will interfere with new plant growth. The toxins build up over the age of a stand and will reduce germination and growth of new alfalfa seedlings. When re-seeding alfalfa in areas where it used to grow, a 1- or 2-year break is recommended. The length of break required depends on the age of the stand, density of alfalfa plants at termination, and how much residue was incorporated into the soil at termination. A break with a cereal crop, like oats or barley, or annual forages can offer alternative forage feed in the meantime. Adding alfalfa to grass-dominated stands has a low success rate as it will not compete well with established plants.

**Remember the six-week fall establishment rule:** Alfalfa plants require at least six weeks of growth prior to the first frost. For the plant to be able to overwinter successfully, the alfalfa crown must be established well enough to be able to store sufficient nutrients to allow for successful overwintering. Seeding too late in the fall can lead to stand failure and winterkill of new plants.

## fall dormancy ratings

A rating of 1 has the least fall growth and a rating of 11 has the greatest fall regrowth. Each rating is separated by a height of 2 inches.

For example, the height difference in the fall regrowth between a rating of 4 versus 5 should be 2 inches.

Generally, less fall-dormant varieties (those with a higher rating) tend to yield more because of the faster regrowth but invest less energy in building root and crown reserves and therefore have poorer winter survival.

fall dormancy rating	description
1, 2	very dormant
3, 4	dormant
5	moderately dormant
6, 7	semi-dormant
8, 9	non-dormant
10, 11	very non-dormant

Source: Adapted from the National Alfalfa & Forage Alliance

## winter survival ratings

rating	description	region of adaptation
1	extremely winterhardy	Northern Plains
2	very winterhardy	Northern Plains/Upper Midwest
3	winterhardy	Northwest/Upper Midwest Central Plains
4	moderately winterhardy	Northwest/Upper Midwest Central Plains
5	slightly winterhardy	Southern U.S.
6	non-winterhardy	Extreme Southwest U.S.

Source: Adapted from the National Alfalfa & Forage Alliance



Photo credit: alfalfapartners.com



# reducing the risk of winter kill or injury

In addition to choosing alfalfa varieties with good winter hardiness and appropriate fall dormancy there are other factors that can increase or decrease the risk of winter injury or winterkill in your alfalfa stand.

- **Fall harvest management:** Ideally, alfalfa should not be harvested during the critical 6-week period before the first killing frost. This will help plants overwinter with high root energy reserves. However, if wildlife pressure is a concern, harvesting very close to, or immediately after, the first killing frost will have minimal impact on root reserves and leave little to attract wildlife. To still support snow trapping, try leaving a 6 inch stubble height if harvesting in the fall or around first killing frost.
- **Stand age:** Young, well established alfalfa stands have a lower risk of winter injury or winter kill compared to older stands.
- **Soil pH level:** Soil pH levels much below 6 increase the risk of winter injury or winter kill.
- **Exchangeable soil potassium (K) level Low ( $\leq 80$  ppm)** exchangeable K increases the risk for winter injury. A range of 121-160ppm is considered optimum.
- **Soil moisture conditions:** Poorly drained soils or wet soils at the start of winter can cause soil heaving and allow frost to penetrate deep into the soil, thereby increasing the risk of winter injury or winter kill.



Alfalfa forms buds in the fall for spring growth. If those buds get injured in winter, the plant has to re-grow buds in the springtime, which delays spring growth and reduces yield. Winter damage to buds can be best observed in the spring when plants are 6 to 8 inches tall. Observe if all stems are roughly the same height, this means there was no or only minimal winter injury. If some stems are about 3 inches taller than others, the taller stems were grown from buds that survived the winter while the shorter stems were grown from buds that had to be formed in the spring.

## varieties

In summary, here are some adaptations available among alfalfa varieties. Please note that this is not a complete list and merely provides some examples. For a full list of currently available alfalfa varieties, contact your local forage seed dealer:

prominent trait	example varieties
high fall dormancy (FD 1 and 2)	Peace, Algonquin, Spyder, Rugged
multifoliate	2065MF, 4020MF
branching rooted	3006, 4010 BR
bloat reduced	AC Grazeland
yellow blossom	AC Yellowhead, Yellow blossom
additional disease resistance	Instinct, Eclipse
salt tolerant	Barricade SLT

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