

## Fall Dormancy and Winter Hardiness of Alfalfa Products

- Alfalfa product selection is one of the most important factors that can help maximize yield potential.
- Products should be selected based on cold or winter hardiness as suitable products for use in one area/region may not survive or perform well in another area/region.
- When selecting a Genuity® Roundup Ready® Alfalfa product, consider both fall dormancy and winter hardiness ratings, as these ratings are not the same and should not be substituted for each other.

### Alfalfa Fall Dormancy

Fall dormancy relates to how soon an alfalfa product stops growing in the fall and how early it begins growing in the spring or late winter. Non-dormant alfalfa products have quicker shoot elongation after harvest and erect shoot growth in autumn. In contrast, fall dormant products produce shorter, prostrate shoots in the fall and have slower shoot elongation after harvest.<sup>1</sup>

It is the length of the season that is determined by a height measurement. Higher fall dormancy scores indicate that there is more fall growth (Table 1). The length of dormancy affects yield as well as winter hardiness. Because fall dormant products have slower regrowth after harvest, the number of cuttings per year and yield may be reduced.

### Alfalfa Winter Hardiness

In the northern United States, winter hardiness is the primary factor in determining alfalfa stand longevity and forage yield.<sup>2</sup> Winter hardiness is determined by the ability of an alfalfa product to withstand winter cold temperatures.

The winter hardiness rating helps indicates how well a product will survive winter temperatures. The lower the winter hardiness rating the greater ability of a product to withstand winter

temperatures (Table 2).

Because early fall dormant products are more winter hardy than non-dormant products, the early-fall dormancy characteristic of a product has traditionally been used as an indicator of winter hardiness.

However, winter hardiness ratings indicate the potential longevity of the alfalfa stand, while fall dormancy ratings indicate the recovery rate.



### Alfalfa Products

When selecting alfalfa products, determine which characteristics are best for your area. Although fall dormancy is somewhat related to winter hardiness, it is not an accurate measure of it. Winter hardiness should be considered as a separate characteristic from fall dormancy when selecting alfalfa products.

Breeders have been successful at disconnecting winter hardiness from fall dormancy. In earlier years, these

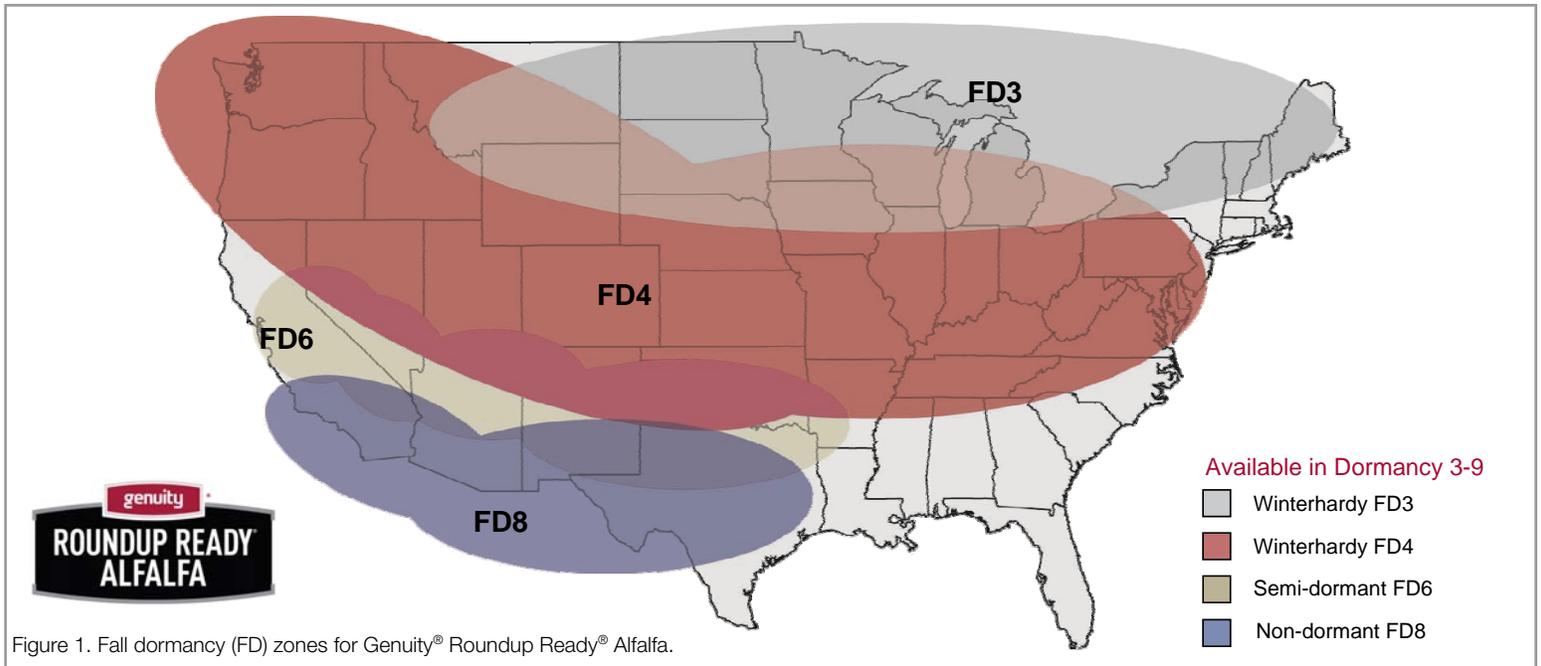
FD Rating	Descriptions
1, 2	Very Dormant
3, 4	Dormant
5	Moderately Dormant
6, 7	Semi-Dormant
8, 9	Non-Dormant
10, 11	Very Non-Dormant

\*Source: Alfalfa Variety Ratings – Winter Survival, Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties, 2014 Edition. <http://www.alfalfa.org/> (verified 9/30/14).

Score	Category
1	Extremely Winterhardy
2	Very Winterhardy
3	Winterhardy
4	Moderately Winterhardy
5	Slightly Winterhardy
6	Non-Winterhardy

\*Source: Alfalfa Variety Ratings – Winter Survival, Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties, 2014 Edition. <http://www.alfalfa.org/> (verified 9/30/14).

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characteristics tended to be closely related. Now it is possible to have a FD4 or 5 with a winter hardiness below 2. Some alfalfa products are capable of surviving lower temperatures than indicated by their fall dormancy rating. Likewise, products that have lower fall dormancy ratings may not be capable of withstanding cold temperatures over multiple years.

Depending on the region (Figure 1), if an alfalfa stand is considered to be for short-term, a moderate winter hardiness rating may be adequate. For long-term stands, alfalfa products with lower winter survival ratings should be considered. In areas that usually receive good snow cover (4 inches or more), planting products with very low winter hardiness ratings might not provide much additional protection. However, snowfall can be unpredictable and protection from a snow cover should not be relied upon. In areas with less snowfall, products with lower winter hardiness ratings should be considered. If stands are thin after a typical winter or fields are slow to greenup, reseeding alfalfa into the field, after the first year of seeding, can be an option for increasing the alfalfa stand, but should be discussed with your agronomist to determine any other potential concerns such as autotoxicity (a toxin that can reduce germination and seedling growth).

Alfalfa products with lower fall dormancy and winter hardiness ratings go dormant earlier in the fall, which can limit productivity and yield for the season. However, single-year productivity can be balanced by the greater likelihood of fall dormant and winter hardy products surviving multiple winters and thereby adding years to the life, overall productivity, and total yield potential of the stand.



In summary, proper product selection and management are important to help maximize alfalfa yield potential and profitability.

Products should be selected based on the classifications for fall dormancy and winter hardiness for a specific region (Figure 2), because alfalfa stand, longevity, and forage quality are affected by the product fall dormancy and winter hardiness. Winter hardiness ratings should not be substituted for fall dormancy ratings as the latter ratings indicate recovery rate of an alfalfa product, while winter hardiness ratings indicate the potential longevity of the stand.

**Sources:** <sup>1</sup>Haagenson, D. 2000. Improving winter survival of alfalfa without sacrificing yield—What we know. Purdue University. <http://www.agry.purdue.edu> (verified 9/18/14); <sup>2</sup>Cash, D. et. al. 1993. Alfalfa variety selection. Montana State University. MT 9303. <http://co.yellowstone.mt.gov> (verified 9/18/14); *Additional sources:* Kaatz, P. 2011. *Selecting the right alfalfa variety.* Michigan State University Extension. <http://msue.anr.msu.edu/> (verified 9/18/14); *Protect alfalfa from winter kill.* 2008. <http://mbfc.s3.amazonaws.com/> (verified 9/18/14).

For additional agronomic information, please contact your local seed representative.

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