

## Comparing Alfalfa Varieties from Lab Analysis Reports

While comparing alfalfa varieties is best done in well controlled university or industry plot trials, some growers desire to compare the quality of alfalfa varieties grown in large fields in a farm setting. In such cases, please keep in mind several confounding factors that could possibly affect forage quality that are difficult to control and may not be directly related to variety differences. These factors may confound the comparison of samples.

- **Maturity.** Delayed harvest and advanced maturity may result in higher Neutral Detergent Fiber (NDF) content and lower NDF digestibility (NDFd). NDF and NDFd tend to be inversely related. In comparing two alfalfa varieties, if one has a lower NDF than the other, even if both were harvested with the same cutting schedule, the variety with the lower NDF is likely less mature and could possess a higher NDFd. For example, if a conventional alfalfa sample has a lower NDF than a HarvXtra® Brand sample analysis, even if both were harvested with the same cutting schedule, the conventional variety could likely have a higher NDFd, possibly approaching or exceeding that of the more mature HarvXtra® Brand sample, simply because of lesser maturity. On the other hand, a sample of higher NDF content could be the result of leaf loss during harvesting due to mechanical, disease or insect stress, which may reduce forage quality.
- **Field Differences.** Soil type, moisture level and soil productivity vary both within a field and among fields. While sampling from multiple sites within a field, or from multiple wagon loads, can help accommodate forage quality differences within a field, it may not compensate for potential differences among fields if each field contains a different alfalfa variety. In such cases, apparent forage quality differences among alfalfa varieties collected from different fields could result merely from differences in field conditions.
- **Sample Frequency.** You would never make a fertilization decision based on just one soil sample taken from a field. Much the same way, you should not compare alfalfa varieties from just one sample. Multiple samples collected from a field or storage structure, preferably across multiple cuttings, will help produce more representative results, as opposed to collecting just one sample.
- **Insect and Disease Stress.** If one alfalfa variety is grown under conditions of insect and/or disease stress, while the other variety is not, this could cause great differences in quality, not necessarily related to variety.
- **Lab Accuracy.** Even though the alfalfa samples being compared will generally be sent to the same lab, NIR digestibility prediction accuracy could be influenced by the sample diversity and number used in developing the prediction equations. If the range and number of calibration samples are limited, low NDFd samples could be over-predicted and high NDFd samples could be under-predicted, causing alfalfa varieties to look similar when they are actually different. Furthermore, results should not be compared across labs due to lab biases.
- **Fall Dormancy.** As the Fall Dormancy rating number increases, lignin content increases and NDFd decreases. Therefore, you should only compare alfalfa varieties of similar fall dormancy.
- **Cutting.** Each cutting of alfalfa represents alfalfa grown under different environmental conditions of temperature, moisture, sun intensity, etc. This will affect forage quality and digestibility. For this reason, you should only compare samples of alfalfa varieties that were harvested from the same cutting schedule and calendar date. Age of the stand could also affect quality if older stands have greater grass and weed presence.
- **Harvest conditions.** Nutrient content and digestibility on the same variety will vary when samples are collected fresh, as haylage, or as hay, mostly related to relative leaf loss. Even when samples are collected in the same harvested form, variations in harvest conditions that can affect leaf loss and soil contamination will influence nutrient content and digestibility assays. For these reasons, you should only compare samples that are harvested and stored similarly.

Because of these many effects, it is very difficult to compare varieties of alfalfa grown and sampled in a farm setting, without extensive sampling from many locations throughout the growing season. For this reason, it is best to evaluate alfalfa variety quality differences from studies conducted in well controlled university or industry plot trials.