2017 AFRP Research Project Objectives

Determining Genetic Factors That Influence Forage Quality in Alfalfa
Washington State University - Norberg

Project Award: $250,000

Objectives:

- This integrated project will use 200 diverse alfalfa varieties, germplasm releases and plant introductions to determine molecular markers and other genetic information that predict hay quality based on the linkage of marker loci with quality traits such as Total Tract Neutral Detergent Fiber Digestibility (TTNDFD). Our overall goal is to implement molecular markers into breeding programs so that new varieties of alfalfa can be generated rapidly to maximize the availability of nutrients in ruminant digestion - this will necessarily involve: i) phenotyping forage quality in a diverse germplasm collection, ii) quantifying the relationship between alfalfa quality and other possible confounding and important agronomic parameters; and iii) identifying molecular markers associated with forage quality. To accomplish these goals we have developed four objectives: 1) Determine quality and stage of maturity at first harvest of 200 alfalfa varieties at four locations in the PNW. Fall dormancy and yield for all cuttings will be determined to identify and reduce confounding factors with quality. 2) Quantify the genetic diversity of alfalfa that is related to forage quality to understand genetic diversity and the genetic resource to breed new alfalfa varieties with higher forage quality. 3) Identify molecular markers associated with forage quality (NDF, NDFD24, NDFD30, NDFD48, kd, iNDF, TTNDFD) traits in alfalfa to provide genetic information to alfalfa breeders. 4) Extend the knowledge gained from project to positively impact alfalfa producers, breeders and others in the alfalfa industry. Breeding programs from industry stakeholders are cooperators on this project which will impact both alfalfa and dairy producers by improving the reliability of access to more digestive alfalfa feed sources.