AGR957 José Varela

Research Proposal Style Seminar:

The Effect of Genetic Background on the Phenotypic Expression of Endosperm Texture Genes in Silage Maize.

In maize forage production, the kernel is a major contributor of energy, therefore improved grain starch content and bioavailability for digestion are important plant breeding objectives. Endosperm texture affects starch degradation rates in ruminants. The range extends from loosely packed (floury) to densely packed (vitreous) starch granules types. This condition is associated with the amount and type of proteins found in the matrix that surrounds the starch granules. The main storage proteins in maize endosperm are prolamins, also known as zeins. Floury endosperm is desired in corn hybrids targeted to animal nutrition because it increases starch degradation in the rumen. There are more than 18 mutants that can exhibit an opaque or floury endosperm. The most widely studied is the *Opaque 2* gene (*o2*), which encodes a defective basic-domain-leucine-zipper bZIP transcription factor, and regulates several endosperm-expressed genes, in particular the 22-kDa α-zein. The objective of this work is to evaluate the effect of genetic background on the expression of the phenotype of opaque genes in a set of diverse maize hybrids. To evaluate this, transgenic RNAi inbred lines were created to act as a ¨dominant negative¨ tester and will be crossed to a set of diverse inbred lines of the Wisconsin Diversity Panel. The resulting F1 progeny will be evaluated in replicated field trials. Seeds from these hybrids will be evaluated using a scanning platform that is able to estimate yield components and also will be phenotyped to quantify the incidence of the opaque endosperm and its effect is seed quality. Currently we are testing a non destructive method to predict the endosperm texture using Near Infrared Tramittance as an alternative to already existent spectroscopy methods that require grinding of the samples.