

Seed Quality Issues and Management in the Era of Biotech Traits

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In conventional alfalfa varieties seed quality commonly encompasses the following three components: germination percentage, genetic purity and seed purity (i.e., freedom from non-crop contaminants). The genetic purity component is managed through a series of processes mandated by the American Organization of Seed Certifying Agencies (AOSCA) and/or Federal seed laws. Included in the requirements are minimum standards for isolation distance between seed production fields of different varieties and, the minimum length of time between seed production of alfalfa varieties in the same field (crop history).

The introduction of biotech alfalfa varieties will introduce two new seed quality characteristics. Trait purity is the percentage of seed that contains the biotech trait. Adventitious presence (AP) is the unintended presence of a biotech trait in non-biotech seed. In general, the goal will be to have high trait purity in biotech varieties and AP levels in non-biotech varieties acceptable for specific seed markets.

Trait purity and AP will be managed using the same tools now used for managing genetic purity in conventional seed production; specifically, isolation and crop history will be used along with good seed handling practices. Information on pollen-mediated gene flow for specific pollinator species is critical for determining the isolation required to meet specific seed quality goals. Forage Genetics has conducted extensive research on leafcutter bee (*Megachile rotundata* F.) mediated gene flow (Fitzpatrick, et. al. 2002). A group at the University of California-Davis has begun generating similar information on honeybee (*Apis mellifera* L.) mediated gene flow (Teuber, et al. 2004).

As a clearing house for field location information on biotech seed production, State Seed Certifying Agencies will likely play a key role in helping seed growers and seed companies manage isolation between biotech and non-biotech alfalfa seed production.

A Forage Genetics plan for managing internal company seed quality for biotech and non-biotech alfalfa seed will be presented as an example.

References

Fitzpatrick, S., P. Reisen, and M. McCaslin. 2002. Alfalfa pollen-mediated gene flow studies, 2000-2001. Proceedings of the 38th North American Alfalfa Improvement Conference. July 17-21, 2002, Sacramento, California. <http://www.naaic.org/Meetings/National/2002meeting/2002NAAICAbstracts.html>.

Teuber, L.R., A. VanDeynze, S. Mueller, M. McCaslin, S. Fitzpatrick and G. Rogan. 2004. Gene flow in alfalfa under honey bee (*Apis mellifera*) pollination (Abstract). Proceedings of the 39th North American Alfalfa Improvement Conference. July 18-22, 2004, Quebec City, Quebec, Canada.