Best Management Practices for Adventitious Presence-Sensitive Alfalfa Seed Production

Introduction

The genetic supplier members (hereinafter called the "Companies") of National Alfalfa & Forage Alliance (NAFA) have agreed to jointly adopt, as a minimum, the following Best Management Practices (BMP) for Adventitious Presence-Sensitive (APS) Alfalfa Seed Production in the United States. Changes to this document will require approval by the NAFA Board of Directors.

These best practices recognize that there are various APS markets, and that market-based standards for adventitious presence (AP) sensitivity levels will vary from market to market and customer to customer. AP sensitivity standards for these markets will evolve over time, and markets that are APS today, may not be in the future, and vice versa. These BMP suggest various tools for meeting these evolving APS market requirements. The genetic supplier members of NAFA are committed to utilizing these methods to ensure that seed supplied to APS markets meets the needs of these markets.

There are two alternative strategies for supplying alfalfa seed for APS markets, one is process-based and one is results-based. Both strategies can be enhanced by the use of Grower Opportunity Zones (GOZ). The method(s) required will be determined by the seed contracting company based on the specific needs of the market and the company's policies.

AOSCA Alfalfa Seed Stewardship Program

The Association of Official Seed Certifying Agencies (AOSCA) working in conjunction with the alfalfa seed industry has developed the Alfalfa Seed Stewardship Program (ASSP). This is an optional process-based certification program that provides third party verification by an internationally recognized organization. The ASSP program requires a five mile minimum isolation from Genetically Enhanced alfalfa (GEA) seed production to meet the process-based certification standards. If isolation is less than five miles, testing of the seed lot for AP is required. Since this five mile distance exceeds the minimum NAFA BMP for GEA Seed Production requirements for all pollinators, no GEA seed production is allowed within an APS GOZ. Successful completion of the ASSP will result in the issuance of seed certification and an Identity Preserved (IP) certificate that can accompany the seed. Producers wishing to obtain ASSP certification should contact the official seed certification agency in their region for further details. The BMP for APS alfalfa seed production contained in this document include many of the key elements of the ASSP program. It should be noted that there is no guarantee that an APS market will recognize ASSP or any other process-based certification.

Seed Testing – A Results-Based Approach

NAFA BMP for GEA Seed Production require a minimum isolation between new GEA seed production planting and the nearest conventional alfalfa seed production field. In many cases conventional seed production will have greater than this minimum distance. If seed of a particular variety is being produced for more than one market (e.g., domestic and export sales), it may be possible to test multiple lots of a variety and select which lots will be sold to APS markets, based on the AP tolerance for the specific market and the level of AP in the various seed lots. There are standard third party assays for AP currently used by the industry. Such an approach requires more testing of lots, and is only appropriate when there are multiple seed lots of a variety being produced and the seed is destined to both AP-tolerant and APS markets. Seed testing may also be required if one or more of the process-based requirements cannot be met in ASSP.

Although there is no uniform AP threshold for all APS seed markets, many APS markets have adopted a "non-detect" standard. Such a standard certifies that there is no detection of the trait in a seed sample of a certain size. A recognized test, that meets many APS market requirements, uses protein-based test strips and/or DNA-based PCR tests to determine presence of the GEA trait. For example, when using test strips, there is a universal standard for the genetic purity of seed. If no GE seeds are found in a 3,000 seed sample (five 600 seed samples) there is 95% probability that the actual AP level in the seed lot is between 0 and 0.1%, and the seed lot meets the non-detect standard (SeedCalc; International Seed Testing Association). Most seed companies currently use this test and/or DNA-based PCR tests to characterize every seed lot destined for export to APS seed markets, and for stock seed planted in APS GOZs, the Imperial Valley, Australia and Canada.

Grower Opportunity Zones

GOZs are grower organized geographic zones designed to help the industry segregate and concentrate APS or GEA seed production. Due to market requirements and the reproductive biology of the alfalfa crop, successful production of APS seed may require extended isolation distances to ensure market standards are met. GOZs are a critical tool in segregating and concentrating genetically enhanced (GE) and APS alfalfa seed production. The organization of a GOZ is described in related NAFA Coexistence documents, Grower Opportunity Zones for Seed Production and Procedures for Forming a Grower Opportunity Zone for Alfalfa Seed Production.

APS GOZ. Within an APS GOZ seed growers likely produce seed for both APS and conventional markets. Current AOSCA seed certification isolation requirements may apply to alfalfa seed fields within an APS GOZ. The assumption is that the conventional seed production fields were established with Foundation Seed with non-detectable presence of GE-traits. It is strongly encouraged that seed companies contracting with growers within an APS GOZ ensure that new seed production plantings use only Foundation Seed with non-detect AP of GE traits.

APS GOZ can facilitate either results-based (i.e., test strips, PCR testing) or process-based (i.e., ASSP) strategies for alfalfa seed production for APS markets.

Non-GE Seed Production Areas

The Imperial Valley of California is a large and concentrated alfalfa seed production area. In light of the unique growing circumstances in Imperial County and the current international approval status of GEA, FGI and Monsanto have worked with the Imperial County Farm Bureau and local stakeholders and established unique stewardship requirements for GEA in Imperial County, which are set forth in the Monsanto Technology Use Guide and Monsanto Technology Stewardship Agreement. All alfalfa seed production in Imperial County currently meets the isolation standards for ASSP, making this a very favorable production area for non-dormant alfalfa seed destined for APS markets.

The GEA seed contractor limits GEA seed production contracts to the following states: Arizona, California, Colorado, Idaho, Kansas, Montana, Nevada, Oregon, Texas, Utah, Washington and Wyoming. States outside of these are additional potential areas for APS seed production.

APS Seed Contractors Responsibilities

The following apply when the seed contractor, in advance, wishes to designate the seed produced from a particular field as being APS.

Communication: The APS seed contractor will ensure that the seed grower is given all necessary information regarding contractual obligations and best practices relevant to producing APS seed.

Isolation: The APS seed contractor will ensure that the isolation distance between the new planting and any established GE seed production meets the isolation requirements for APS seed production as agreed to between producer and contractor. If selected by the APS seed contractor, the ASSP protocol outlines isolations distances from GE alfalfa seed, GE hay fields as well as feral/unmanaged alfalfa.

Seedstock. The seed used to establish the APS alfalfa seed production field should be tested to determine if GE traits are present. Only lots that pass a non-detect strip test or PCR test should be utilized. Seedstock used to produce Adventitious Presence-Tolerant (APT) seed within an APS GOZ should also be tested. If the lot contains AP of a GE trait it should not be planted in an APS GOZ. Seedstock lots used to produce seed under the ASSP program may be tested by the certifying agency.

Validation. Every year the Companies will sample their APS seed lots, test for AP of the GE trait, and transmit such data to the NAFA/AOSCA expert committee for pooled analysis. This annual third party analysis will be used to monitor efficacy of NAFA BMP for APS Seed Production and to make recommendations to NAFA for modifications, if needed.

Reporting. The APS seed contractor shall pin GPS coordinates of all established and planned APS seed increases to the California Crop Improvement Association (CCIA) via the pinning system as early as possible, but no later than two weeks prior to planting. State officials will have access to the CCIA national pinning map and are able to confirm isolation distances. The GEA seed contractors are required to authorize state officials to report to any seed grower or seed company, on request, the isolation distance between a planned new conventional or APS alfalfa seed field and the nearest GEA seed field. The GEA seed contractors shall also notify local state seed certification officials when a GEA seed production field is terminated.

APS Seed Production Placement. The APS seed contractor is encouraged to place contracts in an APS GOZ to limit the potential for AP. Production of APS seed outside of an APS GOZ is subject to increased risk. APS GOZs most likely do not restrict the planting of GE hay which can be a source of AP.

Cooperation. All seed companies are encouraged to communicate and work together to manage joint seed quality issues and concerns.

APS Seed Grower Contracts. The APS seed contractor should clearly stipulate in the grower contract that the seed being produced is for APS markets. Contractors are also encouraged to provide growers with clear and concise requirements to meet the terms of the agreement.

APS Seed Growers Responsibilities

The following apply when the seed contractor, in advance, wishes to designate the seed produced from a particular field as being APS.

A seed grower producing APS alfalfa seed must comply with all the terms and conditions specified in their agreement with the seed contractor. In particular, they are required to comply with the process requirements associated with producing APS seed.

Observe All Federal, State and Local Regulations: It is the APS seed grower's responsibility to know and obey current federal, state and local regulations affecting their agricultural practices. Some examples are as follows:

Federal Laws and Regulations:
- Pesticide use labels and restrictions;
- U.S. Patent Rights;
- Plant Variety Protection;
- Federal Seed Act;
- Phytosanitary laws governing import or export of seeds and pollinators.

State Laws and Regulations:
- Noxious or prohibited weeds, pathogens or insects;
- Pesticide use labels and restrictions.

Local Laws and Regulations:
- Pesticide use notifications (field posting);
- County restrictions or prohibitions on the use of biotechnology, as applicable.

Field History. A field history shall be provided by the grower to the seed contractor for validation of the individual company's requirements and/or the requirements under the ASSP program. In order to mitigate the risks of volunteer plants, the field should not have been used for the production of GE alfalfa seed or hay in the prior four years.

Bees. APS seed growers will manage pollinators to minimize pollen flow from GE fields. There shall be no bee domicile movement from GE or APT to APS seed fields until pollination is finished for the year. Once bees are in APS seed fields, they may only be moved among APS fields. It is the APS seed grower's responsibility to inform their pollinator contractors or bee keepers of this requirement.

Isolation. APS seed grower will assist APS seed contractor with field location planning prior to planting to ensure isolation requirements are met. Growers will also assist in isolation zone monitoring after planting and facilitate crop improvement inspections as requested. If the seed grower learns that new alfalfa seed or hay field(s) are planned or planted in close proximity to the APS seed field, the seed grower will communicate this information to seed contractor. Management strategies for mitigating risks of pollen mediated gene flow may then be implemented by the seed contractor and grower.

Sanitation Requirements. The APS seed grower will manage equipment to minimize seed mixture potential between different varieties and/or variety types. Growers shall use dedicated equipment for planting and harvesting APS seed production, when possible. If this is not possible growers should take reasonable steps to assure that equipment is clean after use in a GEA seed field.

Examples:
- Planter inspection, clean-down before and after use;
- Combine inspection, clean-down thoroughly before and after use;
- Handle all like-type varieties together;
- Plan for harvest sequence of fields to maintain best separation of varieties by trait type;
- Clean all seed handling equipment to avoid mixing APS and conventional seed;
- When a contract harvester is used for APS seed harvest, growers must notify the contract harvester, in advance, that the field to be harvested is APS.

Communication. Immediately communicate questions or concerns to the seed contractor.

Field Records. APS seed growers must record and maintain records that may be required by the seed contractor or by the Seed Certification Officials.

The National Alfalfa & Forage Alliance (NAFA) strongly supports the availability and continued use of biotechnology in agriculture. These advances will allow American farmers to effectively compete in the world market and will enable American farmers to supply abundant, safe, high quality food, fiber and renewable fuel desired by global consumers. NAFA acknowledges and respects different markets and methodologies of food, fiber and renewable fuel production. We believe that science based stewardship management practices allow for the coexistence of these different markets and methodologies in production agriculture. NAFA believes collaborative efforts among all stakeholders are required to develop methodologies that enable coexistence.

Adopted July 2011; Revised June 2014, February 2015, June 2015

"Best Management Practices for APS Alfalfa Seed Production"

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Published by NAFA

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