



Best Management Practices for Genetically Enhanced 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 Genetically Enhanced Alfalfa (GEA) Seed Production in the United States. Compliance is required under a separate and binding agreement of the Companies to each other in this commitment. Forage Genetics International (FGI) is the exclusive licensed seed producer of GEA and will require all GEA seed production sub-licensees (herein after called the “GEA seed contractor(s)”) to become a party to this binding agreement. It is not the intent of this document to establish best management practices for the production of alfalfa seed for Adventitious Presence Sensitive (APS) markets. Changes to this document will require approval by the NAFA Board of Directors.

Grower Opportunity Zones (GOZ) are grower organized geographic zones designed to help the industry segregate and concentrate APS or GEA seed production. NAFA will certify GOZs to ensure that a super-majority of growers and/or acres in a prescribed GOZ align with the decision to focus on either APS or GE alfalfa seed production, at the exclusion of the other. As described later in this document there are different restrictions or isolation requirements that apply specifically to GE seed production within a GOZ. 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.

GEA TRAIT STEWARDSHIP IN SEED PRODUCTION

- This document establishes GEA commercial seed production policies that exceed industry standards for Certified alfalfa seed production.
- Specifically, GEA seed production practices, in relation to isolation from conventional alfalfa seed fields, will meet or exceed Association of Official Seed Certifying Agencies (AOSCA) standards for the seed production of Foundation Class alfalfa seed production.
- All GEA seed growers must complete GEA seed stewardship training and agree to follow the GEA seed production policies as described herein and as required by GEA seed production contracts.

GEA SEED CONTRACTORS RESPONSIBILITIES

Isolation. Within a genetically enhanced (GE) GOZ, the GEA seed contractor will ensure that the AOSCA certified seed production isolation requirements apply between GE and conventional seed. At the GE GOZ border, the GEA seed contractor will ensure that the minimum isolation distance between the new GEA planting and any established conventional or APS seed field meets the following pollinator-specific isolation requirements for GEA seed production. Outside a GE GOZ, the pollinator-specific minimum isolation requirements apply. Note the pollinator designated applies to normal pollinating bees introduced or locally cultured for alfalfa seed production in the area. If more than one pollinator species is introduced or locally cultured, the longer minimum distance applies.

- Leaf cutter bee – 900 feet
- Alkali bee – 1 mile
- Honey bee – 3 miles

NAFA utilizes an annual third party analysis to monitor efficacy of NAFA BMP for GEA Seed Production and to make recommendations to NAFA for modifications, if needed. Every year the Companies sample their conventional seed lots, test for Adventitious Presence (AP) of one or more GE traits, and transmit such data to the NAFA/AOSCA expert committee for pooled analysis.

Reporting. The GEA seed contractor shall pin GPS coordinates of all established and planned GEA seed production fields via the pinning system administered by the California Crop Improvement Association (CCIA) as early as possible, but no later than two weeks prior to planting. State officials will have access to the CCIA national pinning map for GEA seed production and are able to confirm isolation distances. Application for certification to the relevant state agency is required for GEA alfalfa seed production. The GEA seed contractor must authorize state officials to report to any seed grower or seed company, on request, the isolation distance between a planned new conventional alfalfa seed field and the nearest GEA seed field. APS, conventional or organic alfalfa seed growers can then use this third party service to assist them in planning their field locations to meet their company’s isolation or field crop history goals. The

GEA seed contractor shall also notify local state seed certification officials when a GEA seed production field is terminated.

GEA Seed Production Geographic Restrictions. The GEA seed contractor will limit GEA seed production contracts to the following states: Arizona, California, Colorado, Idaho, Kansas, Montana, Nevada, Oregon, Texas, Utah, Washington and Wyoming. There will be no GEA seed production allowed within an APS GOZ

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

GEA Seed Grower Training. The GEA seed contractor will require GEA stewardship training for all new GEA seed growers. GEA seed growers will receive a copy of the NAFA BMP for GEA Seed Production annually (see Appendix 2 – this is a sample form, actual forms may vary). The seed contractor is responsible for mailing or communicating the NAFA BMP for GEA to GEA seed growers.

GEA Seed Grower Contracts. The GEA seed contractor shall document which bee species will be introduced for pollination and incorporate key grower stewardship requirements accordingly (as listed below) in GEA seed production contracts.

License. The GEA seed contractor will have an FGI/Monsanto license for GEA seed production, including reporting requirements for acreage planted and seed harvested, by variety.

GEA SEED GROWER RESPONSIBILITIES

Monsanto Technology/Stewardship Agreement (MTA). GEA seed growers must sign an MTA and are bound by the terms outlined in the current Monsanto Technology Use Guide (TUG). The MTA is a limited-use license for Monsanto traits, and renews automatically each year. The TUG is updated annually.

Observe Patent Rights. All GEA stock seed and harvested seed contains patent-protected traits, therefore:

- All seed transfers/sales are exclusive between GEA seed growers and the GEA seed contractor; no seed may be sold by GEA seed growers to other parties.
- GEA seed growers may not save seed for any purpose as per MTA.

Observe All Federal, State and Local Regulations. It is the GEA 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.

Bees. GEA seed growers will manage pollinators to minimize pollen flow to conventional/other variety fields.

- Only contract-specified bee species can be introduced for pollination supporting GEA seed production.
- There shall be no bee domicile movement from GEA to conventional alfalfa seed fields until pollination is finished for the year.
 - Once bees are in GEA seed fields, they may only be moved among GEA fields. It is the GEA seed grower's responsibility to inform their pollinator contractors or bee keepers of this requirement.
- GEA seed growers will locate domiciles to maximize domicile distance to other varieties, to the extent reasonable and appropriate to each field.
- The main pollinator bee species will be stated on each GEA Seed Grower Contract. Isolation requirements are specific to the main pollinator species.
- If honeybees are not the contract-stipulated pollinator species, GEA seed growers will discourage neighbors from keeping honeybee hives in proximity to GEA seed production. In cases where this cannot be avoided, GEA seed growers are required to report the incident to the GEA seed contractor.

Isolation. GEA seed growers will assist GEA seed contractor with field location planning prior to planting, isolation zone monitoring after planting and facilitating crop improvement inspections as requested.

- The pollinator species-specific isolation policy identified on page one of this document must be adhered to.
- State Certification officials will visit to complete seedling inspection and confirm minimum isolation distances are in place.
- If GEA seed growers learn that new alfalfa seed field(s) are planned or planted in close proximity to the GEA seed field, GEA seed growers will communicate this information to GEA seed contractor. Management strategies for maintaining GEA seed quality (varietal/trait purity) may then be implemented by the GEA seed contractor.

Trait Purity, Weed Control and In-Crop Volunteers.

GEA seed growers are required to adhere to trait purity, weed control measures, and in-crop volunteer control as outlined in their seed production contract.

Stand Take-Out.

- The GEA seed field must be destroyed at the expiration/termination of the seed contract. Take-out must be completed prior to first flower in the subsequent year and reported to the seed certification agency.
- Stand termination and volunteer management measures must be sufficient to render the alfalfa stand worthless for any unlicensed purpose or use (e.g., unlicensed seed, forage, hay or pasture production purpose).

- GEA stand take-out date and method must be reported to the GEA seed contractor using the GEA stand take out form, or the equivalent, to report the information (see Appendix 1 – this is a sample form, actual forms may vary).
- Plan to use a subsequent crop that allows management of alfalfa and GEA volunteers should they occur.

Sanitation Requirements. Manage equipment to minimize seed mixture potential between different varieties and or variety types. Growers shall use dedicated equipment for planting and harvesting GEA seed production, when possible. Zero tolerance for seed admixture is not feasible under commercial production conditions; however, grower should take reasonable steps to assure that equipment is clean prior to and after use in the GEA seed field. Examples:

- Planter inspection, clean-down before and after use;
- Combine inspection, clean-down thoroughly before and after use;
- GEA seed bins may only be used for GEA seed; maintain physical separation of varieties in storage; inspect bins before use;
- Handle all like-trait 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 GEA and conventional seed;
- Return unused, unopened stock seed to the contracting seed company for credit; maintain in clean storage areas;
- When a contract harvester is used for GEA seed harvest, growers will notify the contract harvester, in advance, that the field to be harvested is GEA.

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

Field Records. GEA seed growers must record and communicate the following to GEA seed contractor:

- Planting date; actual acres planted; seed rate/acre; stock seed received/returned;
- Accurate field address with latitude/longitude (decimal degrees) and local field map;
- Seed box/bin numbers used for harvest (will be documented by the seed contractor at plant delivery);
- Stand destruct date and methods implemented using the GEA stand take out form, or the equivalent, to report the information (see Appendix – these are sample forms, actual forms may vary).

Additionally, GEA seed growers must record and retain the following information subject to audit by FGI: herbicide and pesticide application date(s), rate(s), and formulations.

GEA Seed Contractors' Production Staff Responsibilities

- Working in close partnership with seed growers;

- Complying with binding agreements with local crop improvement organizations:
 - GEA seed contractor will report each field location, planting date and stand take-out date to local crop improvement organizations; utilization of the Alfalfa seed production pinning map is required for this process.
- GEA stock seed is identified by a purple colorant for easy identification by seed growers;
- Recommending changes to this document, should the need arise.

REQUIREMENTS SPECIFIC TO GOZ

GOZs are a critical tool in segregating and concentrating GE vs. APS alfalfa seed production and facilitate seed contractors in finding growers/production areas with the desired isolation to meet seed quality/AP market requirements. *NAFA Best Management Practices for GEA Seed Production* in GOZs encourage and facilitate alfalfa seed growers wishing to organize into GOZs. These standards are outlined below.

GE GOZ. Within a GE GOZ seed growers are often producing seed of both GE and conventional alfalfa varieties. GOZs will often be in areas of concentrated alfalfa seed production where isolation distances exceeding current seed certification standards will be difficult. To facilitate coexistence of GE and conventional seed production within a GE GOZ, Certified Seed production isolation requirements will apply between new GE seed production plantings and conventional seed fields within a GE GOZ. Other than the change in isolation requirements, all other elements of the NAFA BMP continue to apply. This requires an understanding that within a GE GOZ the low level presence of GE traits in conventional seed will make these lots best suited for AP-tolerant (APT) domestic markets.

AP-Sensitive GOZ. No GEA seed production is allowed within a APS GOZ.

Roundup Ready® and Roundup® are registered trademarks of Monsanto.

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.

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APPENDIX 1

VERIFICATION OF STAND TAKE-OUT TO TERMINATE THE PRODUCTION OF ROUNDUP READY® ALFALFA SEED

The AGREEMENT: The Grower planted the RRA Proprietary stock seed described below on the acreage described below. In accordance with the terms of the Proprietary Seed Services Agreement for the Production of Roundup Ready Alfalfa Seed, upon expiration or termination of the agreement, the grower must take such actions as are necessary to prevent any future seed harvest or unlicensed use for hay, forage or grazing. Stand destruction must occur not later than first flower in subsequent year. Grower must notify Contracting Seed Company of each stand take-out date and method used to destroy the stand. The Contracting Seed Company must perform on-site verification that each field has been killed and Contracting Seed Company will notify local crop improvement organization of stand termination.

Use a separate form for each field or field group reported to crop improvement.

Experimental or Variety Name: 						
#	Field names	Number of Acres	Field Location: Town-Range-Section & County	Latitude / Longitude (original GPS Coordinate)	# ACRES + DATE(s) + METHOD(s)	SITE VISIT VERIFICATION DATE(s)*
1						
2						
3						
Total no. acres this contract planted:				Total no. acres reported to be killed:		
Seed Company representative verifying information Signature(s) Date(s)				Seed Company representative notifying Crop Improvement Signature(s) Date(s)		

GROWER

By: _____ (signature)
 By: _____ (printed name)
 Title: _____
 Company: _____
 Address: _____

CONTRACTING SEED COMPANY

By: _____ (signature)
 By: _____ (printed name)
 Title: _____
 Company: _____
 Address: _____

APPENDIX 2

These signatures confirm that the RRA Seed Grower has received the NAFA Best Management Practices for Roundup Ready® Alfalfa Seed Production

Contracting Seed Company has communicated NAFA Best Management Practices for Roundup Ready Alfalfa Seed Production to the Grower prior to initial RRA seed field planting and will update Grower annually, thereafter.

RRA Seed Contractor Representative Conducting Initial Grower Training:

PRINT NAME AND ADDRESS	SIGNATURE AND DATE
Seed Company Representative:	 <hr/> Date: _____

RRA Seed Grower Acknowledgement of Training and/or Receipt of NAFA Best Management Practices for Roundup Ready Alfalfa Seed Production:

PRINT NAME AND ADDRESS	SIGNATURE AND DATE
Grower:	 <hr/> Date: _____
Telephone number: _____	

Signature page original to be retained by RRA Seed Contractor.

Signature page copy to be retained by RRA Seed Grower.