



Best Management Practices for Roundup Ready® 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 Roundup Ready Alfalfa (RRA) 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 RRA and will require all RRA seed production sub-licensees (herein after called the “RRA 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 a recommendation from the NAFA Coexistence Committee and 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 Genetically Enhanced (GE) alfalfa 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 new restrictions or isolation requirements that apply specifically to RRA seed production within a GOZ. The organization of a GOZ is described in a related NAFA coexistence document, *Grower Opportunity Zones for Seed Production*.

ROUNDUP READY TRAIT STEWARDSHIP IN SEED PRODUCTION

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

RRA SEED CONTRACTORS' RESPONSIBILITIES

Isolation. The RRA Seed Contractor will ensure that the isolation distance between the new planting and any established conventional seed production meets the following pollinator-specific isolation requirements for RRA seed production. 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

Every year the Companies will sample their conventional seed lots, test for AP of the Roundup Ready 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 RRA Seed Production and to make recommendations to NAFA for modifications, if needed.

Reporting. The RRA Seed Contractor shall report GPS coordinates of all established and planned RRA seed production fields to local state seed certification officials, and to the California Crop Improvement Association (CCIA) as early as possible, but no later than two weeks prior to planting. State officials will confirm minimum isolation and CCIA will establish a national pinning map for RRA seed production. The RRA 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 RRA 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 or the certification agent may use the data to certify a stated isolation distance. The RRA Seed Contractor shall also notify local state seed certification officials, and officials shall confirm when a RRA seed production field is terminated.

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

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

RRA Seed Grower Training. The RRA Seed Contractor will require RRA stewardship training for all new RRA seed growers. The RRA seed grower will confirm having received a copy of the NAFA Best Management Practices for Roundup Ready Alfalfa Seed Production (see Appendix 2).

RRA Seed Grower Contracts. The RRA Seed Contractor shall stipulate which bee species can be introduced for pollination and incorporate key grower stewardship requirements (as listed below) in RRA seed production contracts.

License. The RRA Seed Contractor will have an FGI license for RRA seed production, including reporting requirements for acreage planted and seed harvested, by variety.

RRA SEED GROWERS' RESPONSIBILITIES

Monsanto Technology/Stewardship Agreement (MTA). RRA Seed Grower must sign an MTA and is 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 RRA stock seed and harvested seed contains patent-protected, Roundup Ready trait, therefore:

- All seed transfer/sale is exclusive between RRA Seed Grower and the RRA Seed Contractor; no seed may be sold by RRA Seed Grower to other parties.
- RRA Seed Grower may not save seed for any purpose as per MTA.

Observe All Federal, State and Local Regulations. It is the RRA 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. RRA Seed Grower will manage pollinators to minimize pollen flow to conventional/other variety fields.

- Only contract-specified bee species can be introduced for pollination supporting RRA seed production.
- There shall be no bee domicile movement from RRA to conventional alfalfa seed fields until pollination is finished for the year.
 - » Once bees are in RRA seed fields, they may only be moved among RRA fields. It is the RRA Seed Grower's responsibility to inform their pollinator contractors or bee keepers of this requirement.
- RRA Seed Grower 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 RRA Seed Grower Contract. Isolation requirements are specific to the main pollinator species.
- If honeybees are not the contract-stipulated pollinator species, the RRA Seed Grower will discourage neighbors from keeping honeybee hives in proximity to RRA seed production. In cases where this cannot be avoided, RRA Seed Grower is required to report the incident to the RRA Seed Contractor.

Isolation. RRA Seed Grower will assist RRA Seed Contractor with field location planning prior to planting, isolation zone monitoring after planting and facilitate crop improvement inspections as requested.

- The pollinator species-specific isolation policy is as follows (minimum distance to preexisting conventional seed at planting of RRA):
 - Leaf cutter bee – 900 feet
 - Alkali bee – 1 mile
 - Honey bee – 3 miles
- Once the RRA seed field is planted, State Certification officials will visit to confirm minimum isolation distances are in place. RRA Seed Grower must cooperate with this verification process.
- If the RRA Seed Grower learns that new alfalfa seed field(s) are planned or planted in close proximity to the RRA seed field, RRA Seed Grower will communicate this information to RRA Seed Contractor. Management strategies for maintaining RRA seed quality (varietal/trait purity) may then be implemented by the RRA Seed Contractor.

Trait Purity. RRA stock seed is guaranteed by the provider to have ≥90% RR plants; up to 10% non-RR plants, or "nulls", are normal and expected based on the breeding and genetics of the trait.

- Growers must apply sufficient Roundup® herbicide to kill the <10% nulls prior to 9 inches of growth in the establishment year.
- Apply only registered (labeled) Roundup brand herbicides to the field.

Weeds and In-Crop Volunteers. Manage weeds and volunteers using integrated weed control strategies (e.g., conventional practices supplemented with Roundup agricultural herbicide formulations applied according to the label for alfalfa seed production). Integrated weed control strategies:

- Minimize risk of weed shifts or development of

tolerant weeds. Growers are required to use integrated weed control methods.

- Maintain variety true to type: RRA seed fields need non-Roundup practices to control in-crop Roundup Ready alfalfa volunteers sprouting from prior year seed crop in carry-over fields. This is consistent with conventional alfalfa seed production practices for certified quality seeds.

Stand Take-Out.

- The RRA 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 so that seed certification inspectors can verify stand termination.
- Stand termination and volunteer management measures must be sufficient to allow seed certification inspectors to validate stand take-out and to render the alfalfa stand worthless for any unlicensed purpose or use (e.g., unlicensed seed, forage, hay or pasture production purpose).
- RRA stand take-out date and method must be reported to the RRA Seed Contractor and stand destruction verified by local crop improvement officials using the RRA stand take out form, or the equivalent, to report the information (see Appendix).
- Plan to use a subsequent crop that allows management of alfalfa and RRA alfalfa 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 RRA seed production, when possible. Zero tolerance for seed admixture is not feasible under commercial production conditions; however, grower must take reasonable steps to assure that equipment is clean prior to and after use in the Roundup Ready seed field. Examples:

- Planter inspection, clean-down before and after use;
- Combine inspection, clean-down thoroughly before and after use;
- RRA seed bins may only be used for RRA 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 RRA 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 RRA seed harvest, Growers must notify the contract harvester, in advance, that the field to be harvested is RRA.

Communication. Immediately communicate questions or concerns to the RRA Seed Contractor or to FGI.

Field records. RRA Seed Grower must record and communicate the following to RRA 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;
- Roundup herbicide application date(s), rate(s), formulation used;
- Seed box/bin numbers used for harvest;
- Stand destruct date and methods implemented using the RRA stand take out form, or the equivalent, to report the information (see Appendix).

RRA Seed Contractors' Production Staff Responsibilities

- Working in close partnership with seed growers;
- Complying with binding agreements with local crop improvement organizations:
 - » RRA Seed Contractor will report each field location, planting date and stand take-out date to local crop improvement organizations;
- Coating RRA stock seed purple for easy identification by seed growers;
- Recommending changes to this document, should the need arise.

REQUIREMENTS SPECIFIC TO GOZ

GOZs will be 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. The establishment of new standards for NAFA *Best Management Practices for RRA Seed Production* in GOZ will encourage and facilitate alfalfa seed growers wishing to organize into GOZ. These new standards are outlined below.

GE GOZ. Within a GE GOZ seed growers will likely be 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 in 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. The AOSCA Alfalfa Seed Stewardship Program (ASSP) requires a minimum of five miles isolation from RRA 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 Best Management Practices for RRA Seed Production requirements for all pollinators, a NAFA conforming RRA seed production field in an APS GOZ could jeopardize meeting ASSP isolation requirements for other seed growers in the GOZ. For this reason, no RRA seed production is allowed within a APS GOZ.

Within an APS GOZ seed growers will likely be producing seed for both APS and conventional markets. Current seed certification isolation requirements apply to alfalfa seed fields within an APS GOZ. The assumption here 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 a APS GOZ ensure that new seed production plantings use only Foundation Seed with non-detect AP of GE traits.

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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“Best Management Practices for Roundup Ready® Alfalfa Seed Production”

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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.