

# WHAT ARE THE AVAILABLE TOOLS FOR CO-EXISTENCE OF GE AND NON-GE ALFALFA?

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This presentation is intended to be a brief overview of the strategies and tools for coexistence of conventional, genetically engineered (GE), and adventitious presence sensitive (APS) alfalfa seed and hay. Conventional alfalfa seed and hay sold in most domestic markets is generally AP-tolerant (APT) to low level AP. Details and specific methods of implementation are left to the panel discussion that follows this presentation.

Coexistence is not a new phenomenon in agriculture. The seed certification program, now 70 years old, allows for the coexistence of seed production of various varieties in the same area based on crop biology, production system and isolation that ensure seed genetic purity. Coexistence programs have been successfully adopted by growers of most crops for seed production and products such as sweet corn, where neighboring crops may affect marketability of a specific quality trait. The alfalfa seed and forage alfalfa industries, under the leadership of the National Alfalfa and Forage Alliance, have developed strategies and tools specific to our industry that complement existing programs and procedures. The following is a numbered listing of these tools.

- 1. Cooperation/ Communication** Perhaps the most important tool is good communication and mutual respect between neighbors, individuals and companies who have adopted different approaches to agriculture or identified different market opportunities. The U.S. alfalfa industry is well-developed and capable of addressing specialized contract requirements and has a proven history of successfully delivering quality products to meet various customer specifications. However, every situation cannot be foreseen nor can a rule be written for every contingency. It is paramount that parties involved at every level, growers, companies, government agency representatives, make known their intentions and promulgate an extensive and civil discourse throughout the process. When this is done with sincerity and understanding, many problems are avoided from the beginning.
- 2. Association of Official Seed Certifying Agencies (AOSCA)** AOSCA is a long standing and essential tool for coexistence. The basic AOSCA seed certification program tools include:
  - a. genetic purity of seed stocks.
  - b. appropriate special isolation between commercial seed production fields and neighboring alfalfa seed/hay production fields or feral plants.
  - c. a required crop rotation between seed production of different varieties on the same land.

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- d. The AOSCA seed certification program is designed to reduce genetic off-types to < 2%.
- e. With RR, there may be the introduction of GE traits in alfalfa. Genetic off-types can include the unintended low level AP of GE traits in conventional seed which may require more stringent application of the AOSCA seed certification tools.

- 3. Alfalfa Seed Stewardship Program (ASSP)** - In 2010, AOSCA launched the ASSP, a voluntary, fee-based identity preserved program of process certification for the production of alfalfa seed destined for APS markets. This identity preserved process certification includes the testing and third party verification of genetic origin and non-detect GE trait status of planting seed stock and observance of a minimum stated isolation distance from GE alfalfa seed production. Restated, certification can be achieved through either a process based procedure requiring a minimum five mile isolation distance, or through a results based procedure requiring testing of replicate samples. The ASSP program is an industry procedure established for specific needs and markets. NAFA's Coexistence documents and Best Management Practices are not intended to meet the ASSP levels of isolation.
- 4. California Crop Improvement Association (CCIA) Alfalfa Pinning Map.** To establish a formal system of communications between seed producing companies, in 2010 the industry collaborated with CCIA to develop a web-based alfalfa seed field isolation "pinning" map for alfalfa seed production in the Western U.S. Participants are pinning both APS and GE alfalfa seed production fields as a tool to concentrate and segregate alfalfa seed production destined for these different market segments. To protect the proprietary positions of participants, the map is accessible only to state seed certifying agencies and to genetic suppliers who then use the information to help growers in planting plans.
- 5. Monsanto Technology Use Guide (TUG)** – Primarily for alfalfa forage producers, Monsanto has provided an extensive guide that provides the stewardship, environmental, weed management, and other use guides for Roundup Ready Alfalfa. This guide is invaluable to forage producers who plant RR alfalfa. It also contains detailed guidance for several crops regarding such things as Insect RM, regional planting restrictions, weed resistance management, grain or feed use agreements, selling crops with biotech traits, moving material containing biotech traits and a other useful information. The entire guide can be accessed online at, <http://www.monsanto.com/SiteCollectionDocuments/Technology-Use-Guide.pdf>. As a user of Monsanto Technology, RRA forage producers must follow certain management guidelines. For example, seed containing Monsanto Technologies must be used solely for planting a single commercial crop, Genuity Roundup Ready Alfalfa must be managed for high quality hay/forage production, including timely cutting to promote high forage quality (i.e., before 10% bloom) and to

prevent seed development. As a RRA forage producer it is important that you are familiar with and follow the guidelines.

If you have questions about stewardship (i.e. allowing RRA forage to exceed 10% bloom), please call 1-800-ROUNDUP (1-800-768-6387). You may also send letters reporting unauthorized or improper use of biotech traits to: Monsanto Trait Stewardship, 800 N. Lindbergh Boulevard NC3C, St. Louis, MO 63167. Anyone may provide Anonymous or Confidential reports.

**6. The National Alfalfa and Forage Alliance (NAFA)** – NAFA itself has provided important tools for coexistence. It has been a leader in fostering communication among stakeholders, and in the development of a number of documents outlining procedures and practices that help facilitate coexistence. Each of these documents are also important tools. Summaries of these documents are outlined below. The full text of all of the documents can be accessed at: [www.alfalfa.org/policy](http://www.alfalfa.org/policy) .

- a. **Coexistence Documents** – In October, 2007 NAFA sponsored a forum in Denver, CO attended by scientists, genetic suppliers and producers representing the organic, hay and seed industries. This served as a springboard for the development of coexistence documents for these industries which are summarized below
  - i. **Coexistence for Alfalfa Seed Export Markets** - The document outlines methods of assuring export customers of non-GE alfalfa seed destined for export using current methodology. These methods are neither extraordinary nor expensive. This process includes such things as planting of non-GE foundation seed that has been tested prior to planting; taking steps to ensure adequate isolation prior to planting; application of an identity preserved protocol to assure lot identity and non-GE status; and the use of AOSCA's ASSP program for customer assurance of non-GE status.
  - ii. **Coexistence for Organic Alfalfa Seed & Hay Markets** - This document outlines methods of assuring organic customers of the non-GE status of both alfalfa seed and hay. It complements USDA's National Organic Program (NOP) which regulates the standards for any farm, wild crop harvesting, or handling operation that wants to sell an agricultural product as organically produced. It also complements seed certification systems. Both have well established process-based programs that have delivered high quality products. Both systems tolerate low level thresholds for impurities that reflect market classes for pesticides, weed seeds or varietal seed impurities allowing producers to coexist and meet the needs of organic markets.
  - iii. **Coexistence for Alfalfa Hay Export Markets** – This document addresses coexistence issues relevant to alfalfa hay exporters. Exports are a more significant percentage of the local hay

production acreage in specific regions, notably the Columbia Basin of Washington and the Imperial Valley of California, and specific locations in several other western states, where exports are a key market. Scientific data and decades of experience in the seed and hay industries are the appropriate basis of coexistence and stewardship programs that are responsive to changing agricultural markets. This process includes the elements of the planting of non-GE seed (including testing of seed) for fields destined for GE sensitive export markets, taking steps to minimize the possibility of gene flow between fields through observation of flowering and harvest timing, management of lot identity to assure status of non-GE hay lots destined for GE sensitive export markets, and testing of lots to assure customers of the non-GE status of hay lots. It is suggested that state departments of agriculture, or crop improvement associations, or other industry entities (such as producer groups) may wish to provide public documentation of these processes, with accompanying certifications so that producers may serve GE sensitive export markets.

- b. **Best Management Practices (BMP)** - The genetic supplier members (hereinafter called the “Companies”) of the 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.
  - i. **Best Management Practices (BMP) for Roundup Ready Alfalfa (RRA) Seed Production in the United States.** This document outlines basic areas of responsibility including:
    - 1. RRA Seed Contractors Responsibilities include assuring that the isolation distance between the new planting and any established conventional seed production as follows: a. Leaf cutter bee – 900 feet, b. Alkali bee – 1 mile, c. Honey bee – 3 miles. They also are responsible for reporting GPS coordinates to both the local state seed certification officials and to the CCIA for inclusion on the pinning map, respecting seed production geographic restrictions (relegated to certain states), providing RRA seed grower training, providing seed grower contracts stipulating which bee pollinators can be used and outlining other stewardship responsibilities, possessing an FGI license and, in general working with growers and other companies to manage quality issues and concerns.

2. RRA Seed Producer Responsibilities. All RRA seed growers must complete RRA seed stewardship training and agree to follow the RRA seed production policies as described therein and as required by RRA seed production contracts. They also are required to observe all patent rights, state, local and federal laws and regulations, manage bee pollinators to minimize pollen flow to conventional/other variety fields, assist the contractor with field location planning prior to planting, manage weed including applying RR herbicide according to label specifications, maintaining variety true to type, destroying RR seed fields as prescribed in the contract, and following sanitation requirements related to all equipment.

ii **Best Management Practices for Adventitious Presence-Sensitive Alfalfa Seed Production.**

These best practices recognize that there are various APS markets, and that market-based standards for 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 specified AP tolerance standards. 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 or results-based certification program that provides third party verification by an internationally recognized organization. ASSP program requires a five mile minimum isolation from RRA seed production to meet the process-based certification standards. If this requirement cannot be met, results based certification is employed which requires advanced testing for AP presence.

- c. **Commitment from four largest Genetic Suppliers** – Cal West Seed, Dairyland Seeds, Forage Genetics International and Pioneer Hi-Bred International are all members of NAFA and have committed to adhere to these BMPs. Further, the companies have been instrumental in their creation and serve as an integral part of their evolving development over time.
- d. **Grower Opportunity Zones (GOZ)** Grower Opportunity Zones are grower organized geographic zones designed to help the industry segregate and concentrate Adventitious Presence Sensitive (APS) or Genetically Enhanced (GE) alfalfa seed production. They are formed by following procedures outlined on the NAFA website ([www.alfalfa.org/policy/CoexistenceDocuments](http://www.alfalfa.org/policy/CoexistenceDocuments)) GOZs are a critical tool in segregating and concentrating GE and APS alfalfa seed production. Two types of GOZs can be formed:

- i. AP-SENSITIVE GOZ. This is a zone for seed production of APS alfalfa seed and conventional alfalfa seed. RRA seed production would not be allowed in an APS GOZ.
- ii. GE GOZ. This is a zone for seed production of GE and conventional alfalfa seed that is destined for markets that are not APS. APS alfalfa seed production would not be practical in a GE GOZ.

There are currently 11 organized GE GOZs. There is 1 APS GOZ in process with two more being considered.

## **CONCLUSIONS**

In conclusion, it is well to emphasize that these tools are just that – tools. They are there to assist in coexistence efforts and assuredly will not work in every case or answer every question. An underlying foundation of every tool is the principle of communication and cooperation without which most of these tools will have only marginal, if any, success.