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## Demonstration of Co-existence of RR and Conventional Alfalfa Hay Fields

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### **Background:**

Roundup Ready® (RR) alfalfa became commercially available in 2005. The genetically-engineered RR trait allowed alfalfa to tolerate the broad-spectrum, post-emergence herbicide, glyphosate. A lawsuit in 2007, however, stopped any further planting. It was not until January 2011 that RR alfalfa was granted non-regulated status and planting resumed.

### **Concerns:**

There are concerns among growers, marketers, and the general public about the co-existence of RR and conventional alfalfa. Key among the concerns is the possibility for the RR trait to transfer by pollen to conventional alfalfa, known as adventitious presence (AP). Gene flow has been measured between alfalfa fields grown for seed production; however, gene flow between fields grown for hay is largely prevented due to management barriers to AP. The primary barrier is that hay is generally cut before 10% flowering, so seed is rarely allowed to form, let alone mature. Nevertheless, it is courteous and wise to employ practices that allow the co-existence of RR and conventional alfalfa. The following are advised practices (Putnam, 2006).

1. Grow certified seed.
2. Understand the potential for gene flow. Cross-pollination is required in seed production but not in forage production.
3. Understand the limits of alfalfa gene flow between hay fields. Limits include the timing of flowering, the presence of pollinators, and the success of pollination, among others.
4. Control nearby feral alfalfa.
5. Be aware of neighboring non-genetically engineered (GE) hay.
6. Prevent the mixing of hay lots or carry-over bales between fields.
7. Test for GE traits.
8. Understand tolerances, particularly as they relate to markets.

### **Test Kits:**

The majority of the alfalfa market is not sensitive to GE products; nevertheless, test kits are a tool that may be used when customers are sensitive to GE crops. The availability of these strips allows producers and sellers of hay to be product-based for niche domestic and export markets. The following products may be used to detect the presence of RR alfalfa in hay, seed, or fresh leaf tissue, and protocols are available from the manufacturers' websites.

1. Agdia® ImmunoStrip® STX 74000. <https://orders.agdia.com/homepage.asp> or 1-800-62-AGDIA. Orders can be made online, and the cost is \$110 for 50 test strips. Strips have a detection limit of 1 in 100 seeds.
2. Envirologix™ QuickStix™ Kit. [http://www.envirologix.com/artman/publish/article\\_177.shtml](http://www.envirologix.com/artman/publish/article_177.shtml) or 1-866-408-4597. Order by phone. Cost is \$360 for 100 strips, but volume pricing may be available. Strips have a detection limit of 1 in 600 seeds.
3. If you discover another manufacturer's product, be sure to verify that the product is validated for alfalfa. For example, Neogen® Corporation sells the Agri-Screen® strip test, but this product has only been validated on soybeans and corn – not on alfalfa.

*The information on products and practices is for educational purposes only and does not constitute an endorsement or recommendation by the University of California.*

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### **References:**

Putnam, Daniel. 2006. Methods to Enable Coexistence of Diverse Production Systems Involving Genetically Engineered Alfalfa. University of California Agriculture and Natural Resources Publication 8193. <http://anrcatalog.ucdavis.edu>.

Putnam, D.H. and S.B. Orloff. 2013. Chapter 18: Benefits and Risks of Adapting Genetically-Engineered Crops: The Roundup Ready Alfalfa Story. Cool Forage: Advanced Management of Temperate Forages. Pacific Field Corn Association. Agassiz, BC. [www.farmwest.com](http://www.farmwest.com).