

FACT Sheet
Genetically Engineered (GE) Alfalfa



Coexistence Strategies*

*GE varieties must co-exist with sensitive markets
(likely <5%), i.e., organic, horse, export.*

Select Certified Varieties for seed purity and quality

- This is the most crucial step for those selling to sensitive markets.
- Must assure low adventitious presence (AP) of GE seed
- Check with provider about AP or use strip test to check for presence of GE seed before planting

Understand Potential for Gene Flow

- Cross-pollination due to bees needed for seed production, not for forage production
- Potential for gene flow not same for alfalfa grown for hay as that grown for seed
- In CA seed fields pollinated with honey bees, gene flow: 1.5% @ 900 ft; <1% @ 2500 ft; sporadic at 2.5 mi

Understand Limits of Gene Flow From Hay Field to Neighboring Hay Field

- For gene flow to occur, 1) Fields must flower simultaneously, 2) pollinators must move between fields; 3) pollen must fertilize plant; 4) embryos must turn into seeds; 5) seed must fall to ground and germinate; 6) germinating plants must compete with existing alfalfa
- There are severe limits to each of these steps in hay fields (environmental screens)
- Most dairy hay is harvested pre-bloom; the few surviving seeds that may germinate do not contribute significantly to hay biomass (estimates at <0.001%)

Control Feral Alfalfa Near Hay Fields

- Cultivated alfalfa not known to cross with any wild plant or weed in U.S. other than feral alfalfa
- Feral alfalfa along roads, ditches serves as bridge for pollinators and should be controlled to limit gene flow

Inventory Control, Marketing

- Be aware of crops destined for sensitive markets – identify specific hay lots
- Prevent Mixing of Hay Lots for sensitive markets
- Understand the tolerance of your market: in Japan if greater than 5%, EU >0.9% is GE, it must be labeled as such

Text for GE Traits in Hay

- Test strips available commercially can be used to identify GE traits in leaves, haystacks and in ground hay samples
- As final market assurance, provide strip test result to customer

General Information*

*Alfalfa is traded as a free market commodity.
Perceptions are often more powerful than objective facts.*

Only commercially available GE alfalfa is currently Roundup Ready (RR)

– tolerant to glyphosate or Roundup

- Alfalfa: CA's largest acreage crop: 1.05 million acres; value \$800 million - \$1 billion
- Based on substantial equivalence, government agencies say RR alfalfa is safe for animal feed
- Alfalfa has been used for three major markets: dairy, beef, horses; small amounts exported and for sheep/goats/pets/rabbits

Alfalfa for dairy: ~75% of production is for dairies, either on-farm or sold

- Dairies may not be as sensitive to RR alfalfa since GE crops being fed in large quantities to animals (corn, soy, canola, cottonseed meal); GE rennin used for cheese production; rBST for milk production
- Exception is organic where GE is not permitted; small (<1%) but growing market

Alfalfa for horses: alfalfa/alfalfa-grass most important hay crop for horse industry

- Buyers have individualized preferences – some will reject RR alfalfa
- RR alfalfa should decrease presence of poisonous weeds reducing animal sickness/death, so some users will prefer RR alfalfa

Alfalfa for beef, sheep, goats: larger percent of nonalfalfa forage fed to these animals than with dairy

- Less than 1% of beef production is organic
- Remaining production might not be as sensitive to GE, similar to dairy usage
- Sheep/goat usage tied to ethnic/specialty users – may be more sensitive to GE alfalfa

Alfalfa for seed: presents specialized challenges but acreage is much smaller and localized

Effect of GE alfalfa on exports: in 6 western states, 4.5% of production exported; presently majority of exporters sensitive to GE alfalfa; % exported in CA's Imperial Valley and WA state is higher

- Japan – largest recipient of U.S. hay – approved RR alfalfa for import in Feb. 2006
- Feb 2006 U.S. deregulated GE alfalfa; importers might still require GE-free, but some will accept RR alfalfa
- RR hay can be legally exported to Canada/ Mexico as well as Japan

**Condensed from "Methods to Enable Coexistence of Diverse Production Systems Involving Genetically Engineered Alfalfa" by D.H. Putnam April 2006. Agricultural Biotechnology in California Series #8193. Prepared by Peggy G. Lemaux. Full text available in Resources section at ucbiotech.org*

USEFUL LINKS

General Information:

<http://ucbiotech.org>

General information about ag biotech in a biotechnological information Q&A section. Also video, fact sheets, GE legislation, displays in resource section.

<http://alfalfa.ucdavis.edu/+producing/biotech.html>

University of California Alfalfa and Forages Workgroup

Agriculture and Farming

<http://www.marketchoices.info>

Information about facilities & countries that accept GM & non-GM corn products.

Biotechnology Information

<http://pewagbiotech.org/resources/factsheets/crops>

Pew Initiative on Food and Biotechnology with 2005 consumer poll results, and information on environmental and food safety issues.

<http://www.ers.usda.gov/publications>

Report on Size and Distribution of Market Benefits from Adopting Biotech Crops

<http://www.whybiotech.com/index.asp?id=2837>

CBI list of biotech agricultural products: A comprehensive article that lists every biotech agricultural product that has been approved in Canada, Mexico & the US.

<http://www.colostate.edu/programs/lifesciences/TransgenicCrops/>

Colorado State University: General information about ag biotech, introduction and resource guide.

http://europa.eu.int/comm/food/food/biotechnology/authorisation/index_en.htm

Genetically Modified (GM) Foods Authorized in the European Union under Novel Food Regulation Rule (EC) 258/97 (January 17, 2006)

Regulatory Issues

<http://www.icgeb.org/~bsafesrv/bsfdata3.htm>

The ICGEB database, updated monthly, contains published references on biosafety studies.

<http://usbiotechreg.nbii.gov>

Contains a searchable database with information on all genetically engineered crop plants for food or feed that have completed the recommended or required reviews

*For more information, please visit Dr. Peggy Lemaux's website at <http://ucbiotech.org>.
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