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 hay 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 maybe not 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
- 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

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

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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