

DuPont™ Express®

herbicide

With TotalSol® soluble granules

Optimize the DuPont™ ExpressSun® trait system with Express® herbicide

Benefits of the ExpressSun® trait

Herbicide-tolerant sunflower hybrids can provide producers with technology to aid in the control of annual and perennial broadleaf weeds. High-yielding sunflower hybrids from Pioneer Hi-Bred include the DuPont™ ExpressSun® trait with built-in tolerance to tribenuron methyl, the active ingredient in DuPont™ Express® herbicide (with TotalSol® soluble granules). Express® research trials have demonstrated in-season control of Canada thistle and control of many other annual broadleaf weeds in conventional, minimum-till or no-till sunflower production systems.

The ExpressSun® trait system is designed to maximize weed control in sunflower crops, thereby enhancing production and yield. ExpressSun® combines herbicide tolerant sunflower seed with the Express® trait herbicide to provide improved weed control over conventional systems.

ExpressSun® trait development

Application of tribenuron methyl, the active ingredient in Express® herbicide (with TotalSol® soluble granules), to conventional (non-Express®-tolerant) sunflower will result in significant crop injury or plant death. In contrast, herbicide-tolerant sunflower hybrids with the ExpressSun® trait possess genetic tolerance to tribenuron methyl.

Pioneer has introduced herbicide-tolerant sunflowers with the ExpressSun® trait for the 2007 season, and will continue to develop new herbicide-tolerant hybrids for introduction in 2008 and beyond.

Unlike other herbicide-tolerant crops, such as Roundup Ready soybeans with the Roundup Ready gene, herbicide-tolerant sunflowers with the ExpressSun® trait were derived through traditional plant-breeding methods and are non-GMO products. Resistance to Express® herbicide has been bred into Pioneer's elite sunflower germplasm.

Express® herbicide (with TotalSol® soluble granules):

- Is a member of the sulfonylurea family of herbicides. The active ingredient is tribenuron methyl.
- Has been extensively used in wheat and barley for more than 14 years to control broadleaf weeds, and is effective in controlling Canada thistle.
- Dissolves completely into ions that are readily absorbed by weeds, resulting in more-consistent control over a wide variety of environmental conditions.
- Is formulated as a 50 percent active water-soluble granule.

Studies indicate that Express® herbicide (with TotalSol® soluble granules) presents a low risk to mammals, birds, fish and other nonplant wildlife when used in accordance with the label.

Stewardship

It is well-known that domestic sunflowers can readily outcross to wild sunflowers. To preserve the efficacy of the ExpressSun® trait, producers will be required to follow specific management practices designed to prevent or delay herbicide resistance in wild species of sunflowers. These practices span crops to promote herbicide resistance management.

- Always grow sunflower hybrids with the ExpressSun® trait as part of a multiyear rotation with other crops.
- Use non-ALS/AHAS (non-group 2) mode-of-action herbicides in a tank mix with ALS/AHAS herbicides, or as sequential treatments in the rotational crop, to control wild and volunteer sunflowers.
- Control wild sunflowers in non-crop areas adjacent to ExpressSun® trait sunflower fields through the use of non-ALS/AHAS herbicides and/or mowing prior to seed set.



- Use tillage to control emerged wild sunflowers prior to planting hybrids with the DuPont™ ExpressSun® trait, or by utilizing non-ALS/ AHAS burndown herbicides, or use ALS/AHAS burndown herbicides in a tank mix with non-ALS/AHAS herbicides to provide control of sunflowers.

- As practical, use ALS/AHAS herbicides in a tank mix with non-ALS/AHAS (non-group 2) mode-of-action herbicides or use ALS/AHAS herbicides, in a sequential program that employs alternate modes of action to control wild and volunteer sunflowers.

DuPont™ Express® herbicide (with TotalSol® soluble granules)

Rate and timing

- Postemergence: 1/4 to 1/2 ounce per acre. Do not exceed 1 ounce per acre per use season.

Adjuvant

- Methylated seed oil at a rate of 1 gallon per 100 gallons of spray solution.

Application method postemergence

- Applying DuPont™ Express® herbicide (with TotalSol® soluble granules) using a minimum spray volume of 5 gallons by ground or 2 gallons by air provided good weed control.

Condensed list of broadleaf weeds controlled or suppressed

Buckwheat, wild*	Nightshade, hairy*
Chamomile, mayweed	Pennycress, field
Chamomile, wild	Pineapple-weed
Chickweed, common	Pigweed: redroot, tumble
Falseflax, smallseed	Puncturevine
Flixweed	Purslane, common
Kochia**	Shepherd's-purse
Lambsquarters: common, slimleaf	Smartweed, Pennsylvania*
Lettuce, miner's	Sowthistle, annual*
Lettuce, prickly**	Tansymustard
Marshelder	Thistle: Canada, Russian**
Mustard: black, blue (purple mustard), wild	Vetch*: common, hairy
	Wallflower, bushy (treacle mustard)

* Partially controlled weeds exhibit a visual reduction in numbers as well as a significant loss of vigor.

** Resistant biotypes were not always adequately controlled.

Application timing

- Apply Express® from the one-leaf stage up to (but not including) bud formation.
- Depending on environmental conditions, a second application may be needed 14 or more days after the first application.
- Do not apply within 70 days of sunflower harvest.

This reference guide is not intended as a substitute for the product label for the product(s) referenced herein. Product labels for the above product(s) contain important precautions, directions for use and product warranty and liability limitations that must be read before using the product. Applicators must be in possession of the product label(s) at the time of application. Always read and follow all label directions and precautions for use when using any pesticide alone or in tank mix combinations.

The DuPont Oval Logo, DuPont™, The miracles of science™, Assure®, Express®, ExpressSun® and TotalSol® are trademarks or registered trademarks of DuPont or its affiliates.

Roundup Ready is a registered trademark of Monsanto Technology LLC. Spartan is a registered trademark of FMC Corporation.

Copyright © 2006-2009 E.I. du Pont de Nemours and Company. All Rights Reserved. 1/09 Reorder No.: K-15031 (Replaces K-14631)



The miracles of science™