

CLEAR CHOICE CONCENTRATE SELECTIVE HERBICIDE

LANDSCAPE PROFESSIONAL MARKET
CANADA

**Clear
Choice**
Concentrate Selective Herbicide
Herbicide sélectif concentré

Our Mission

- ❖ We create energy for a better world.

Our Vision

- ❖ To be trusted stewards of valuable natural resources. Guided by our values, we will lead the way to deliver economic prosperity, improved social well-being and a healthy environment for today and tomorrow.



- ❖ Petro-Canada Lubricants is a specialized division of Suncor that produces 350 different products, sold in 70 different countries
 - ❖ The largest producer of quality lubricant base stocks in Canada
- ❖ Service over 15 commercial segments including:
 - ❖ Automotive
 - ❖ Mining
 - ❖ Pharmaceutical
 - ❖ Food
 - ❖ General Manufacturing
 - ❖ **Lawncare & Agriculture**
 - ❖ 20 years of history in agriculture with PureSpray
 - ❖ Developed and made in Canada



99.9% Pure

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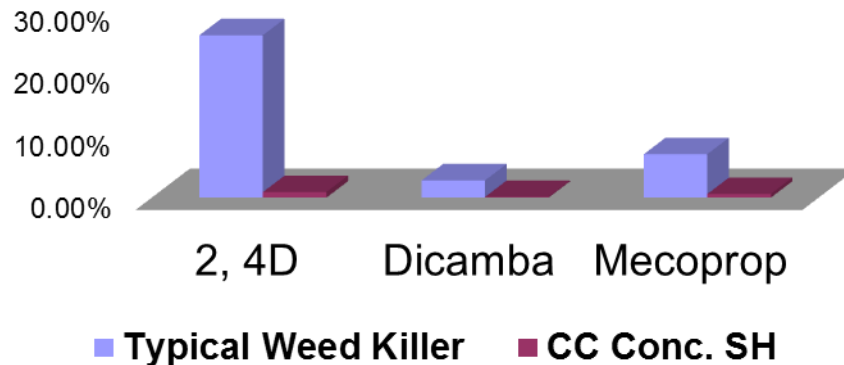
- ❖ Suncor's white mineral oil (under the Petro-Canada Lubricants brand) is 99.9% pure and readily biodegradable. It is used in pharmaceuticals, cosmetics, food grade plastics and many other products requiring non-toxicity.



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Market opportunity – selective herbicides



❖ Current market situation:

- ❖ There is a vast array of similar products, all based on the same chemical make-up
- ❖ Trend is towards more regulated restrictions of efficacious products

❖ Opportunity:

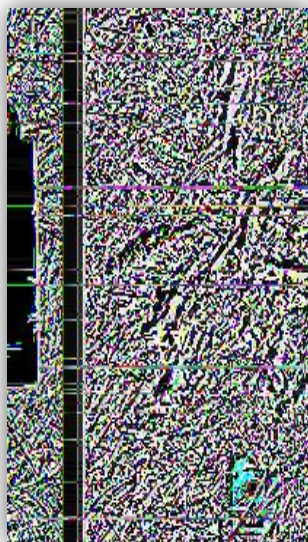
- ❖ No products have been developed that offer both efficacy and reduced chemicals

Opportunity for a low chemical selective herbicide formulation in the market that maintains acceptable efficacy

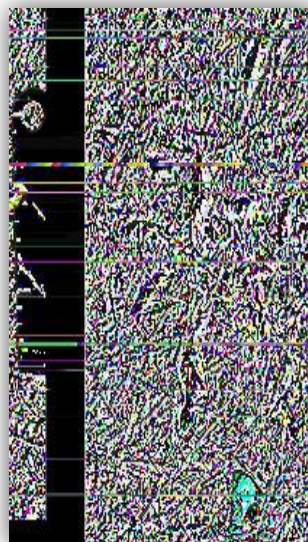
Targets weeds, not lawns

Clear Choice™ Concentrate Selective Herbicide eradicates broadleaf weeds while doing no harm to surrounding vegetation (dandelions).

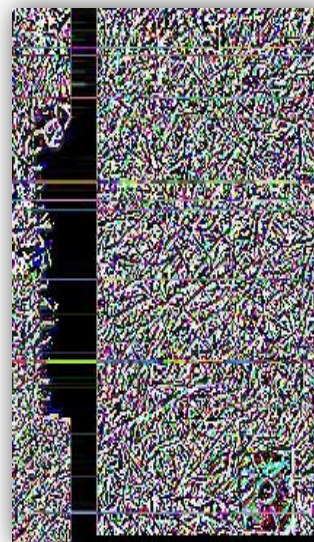
Before Treatment



2 Days After
Treatment



15 Days After
Treatment



University of Guelph, 2007

Commercial application - Mississauga 2008 trial

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Pre-treatment



1 Week post-treatment



4 Weeks post-treatment



Clear Choice Concentrate Selective Herbicide
demonstrates proven efficacy on dandelions

The unique technology behind Clear Choice

Clear Choice
Concentrate Selective Herbicide
Herbicide sélectif concentré



- ❖ Utilizes Patent Pending Technology
- ❖ A unique blend of pure synthetic isoparaffins and technologically advanced surfactants results in improved efficacy
- ❖ The technology creates a carrier system that delivers product into the plant, thus allowing for more efficient transmission of the active ingredients to the plant

Clear Choice technology means significantly fewer chemicals are required to control unwanted broadleaf weeds

Reduced Active Ingredients



Clear Choice™ Concentrate Selective Herbicide **reduces** the active ingredients (including 2,4-D) by **60% to 80%** in comparison to other competitive products.

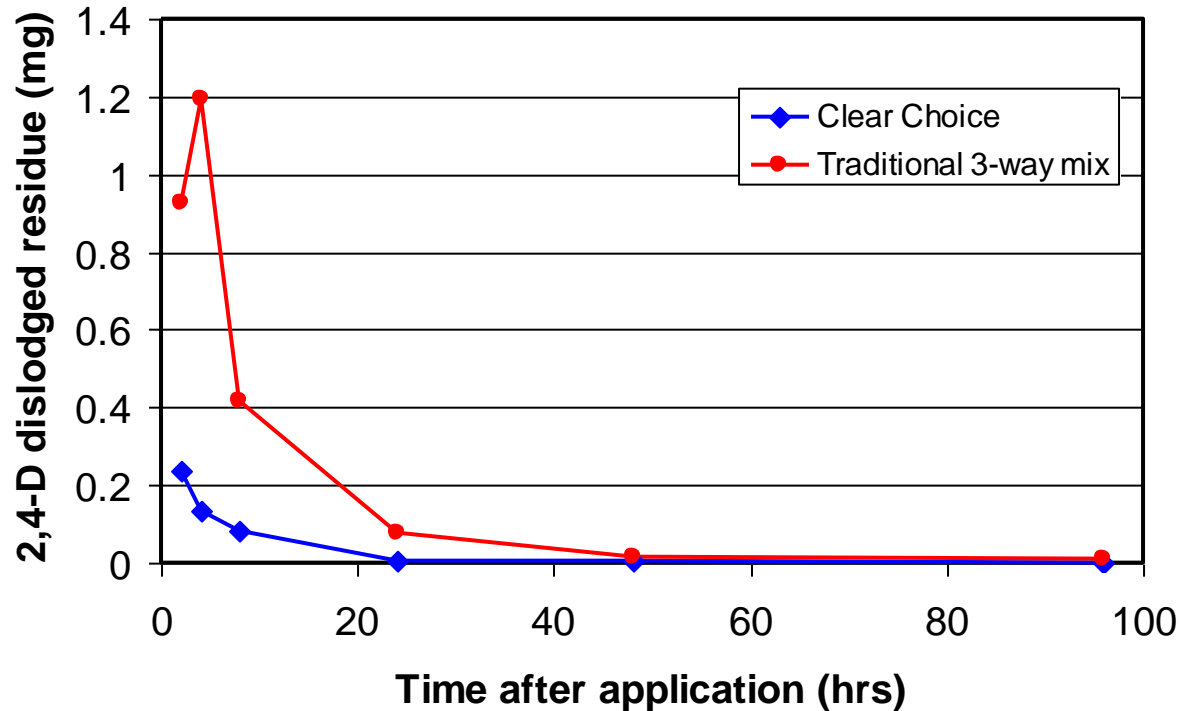
Active ingredients
in other Conventional
Herbicides

Active ingredients
in **Clear Choice™**

Residual chemical exposure is significantly reduced



Dislodging Residue Research -- as it relates to consumer safety



Clear Choice Concentrate Selective Herbicide has less dislodgable residues after application when compared to the traditional 3-way mix. As a result, residual chemical exposure to the end consumer is significantly reduced.

What's in it for the consumer?



Clear Choice offers the homeowner with a selective herbicide that is:

- Effective** →
- Innovative microtechnology
 - Controls most broadleaf weeds
- Safe** →
- Low Odour
 - No Caution or Poison hazard symbol
- Reduced Chemical** →
- Reduced amounts compared with conventional 3-way mix products



**An effective & reduced chemical product at a competitive price =
Clear Choice**

The clear features & benefits for you



New, Innovative Technology

- ❖ You will stay on the cutting edge technology with this product and it's Canadian-made. Allows you to offer your customers something different and effective while using less chemicals - patent pending microtechnology

Less Chemical while being efficacious

- ❖ Reduced amount of potentially harmful active ingredients by up to 80% compared with conventional 3-way mix products
- ❖ Less dislodging residue
- ❖ See results in hours

Low Odour Formula

- ❖ Benefit to technicians and consumers
- ❖ Little to no odor

White in colour

- ❖ White emulsion when diluted with water - easy to tell where you have sprayed
- ❖ You can see where the grounds have been treated

Weed Free, Worry Free- Uses up to 80% less active ingredients compared to competitors using the same actives.

The clear features & benefits for you



Low Drift

- ❖ Less damage to non-targeted plants
- ❖ A benefit to both applicators and homeowners

Controls weeds down to the root without harming lawn

- ❖ Controls broad-leaf plantain, narrow-leaf plantain, black medick, and white clover. Suppresses dandelions.

No signal word (that is, no hazard symbols required)

- ❖ Benefit compared to other traditional herbicides

Do more with less! Great results using less active ingredients!

Clear Choice Concentrate Selective Herbicide allows Weed Man Canada to use the innovative technology (created and produced in Canada) to offer their consumer:

- 1. Maximum Efficacy:** Performance is still #1 while balancing less chemicals
- 2. Cost Effectiveness:** Excellent cost-benefit return to your customer
- 3. Regulatory Considerations:** Approved and registered by the Pest Management Regulatory Agency for use on residential lawns

APPENDIX

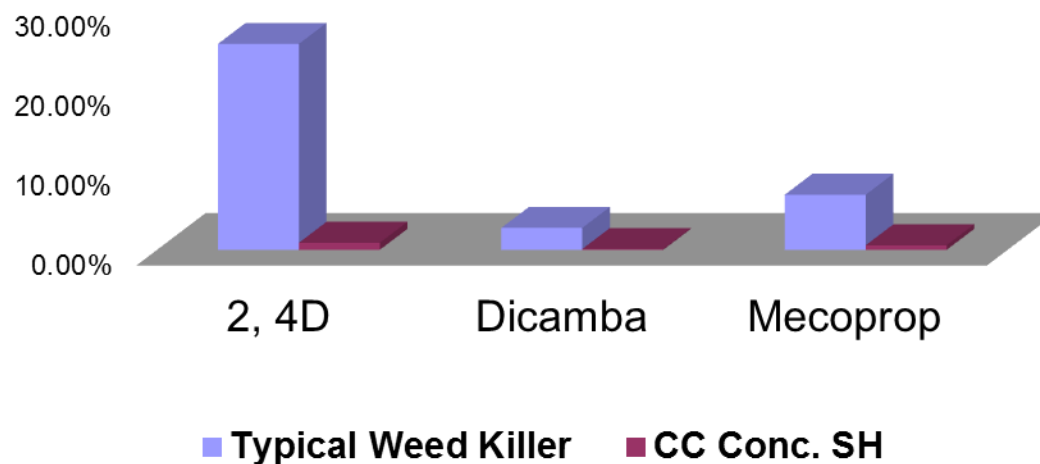
ADDITIONAL SUPPORT

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Even with Significantly less Active Ingredients, it effectively does the job!



Clear Choice Concentrate Selective Herbicide provides efficacy with significantly reduced active ingredients



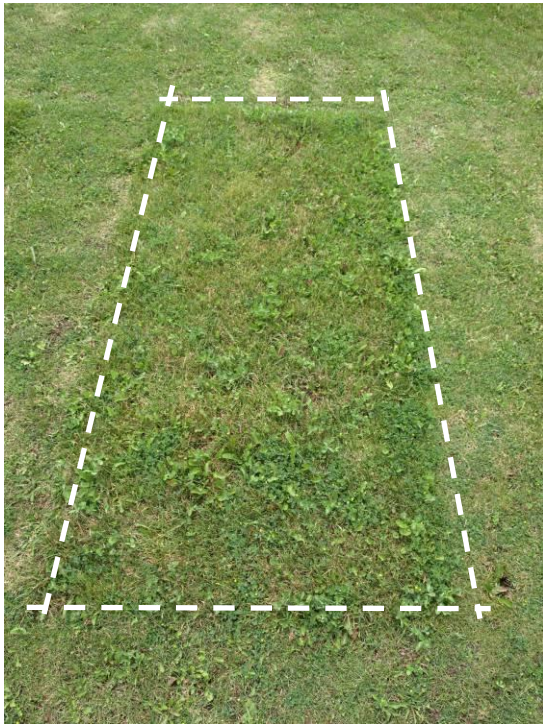
Even with significantly less active ingredients it effectively does the same job. In fact, less than 1.6% active ingredients (AI) are used compared to the typical 25%+ AI.

That means Clear Choice Concentrate Selective Herbicide kills weeds dead with improved sustainability.

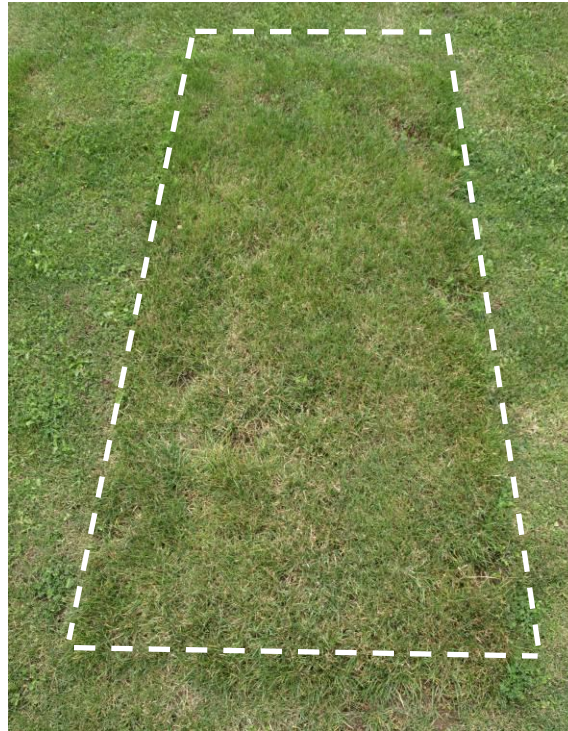
Efficacy 6 weeks post treatment – broadleaf weeds

Efficacy in controlling broadleaf weeds - 6 weeks post treatment

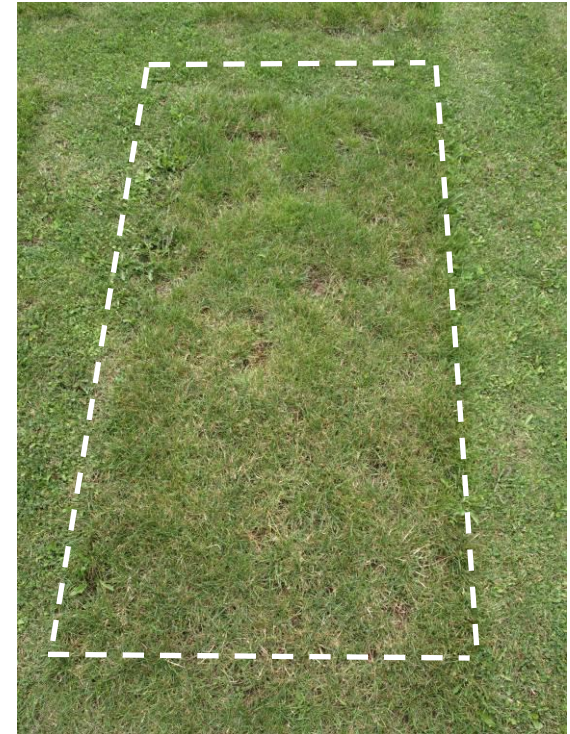
Untreated



Clear Choice
Concentrate

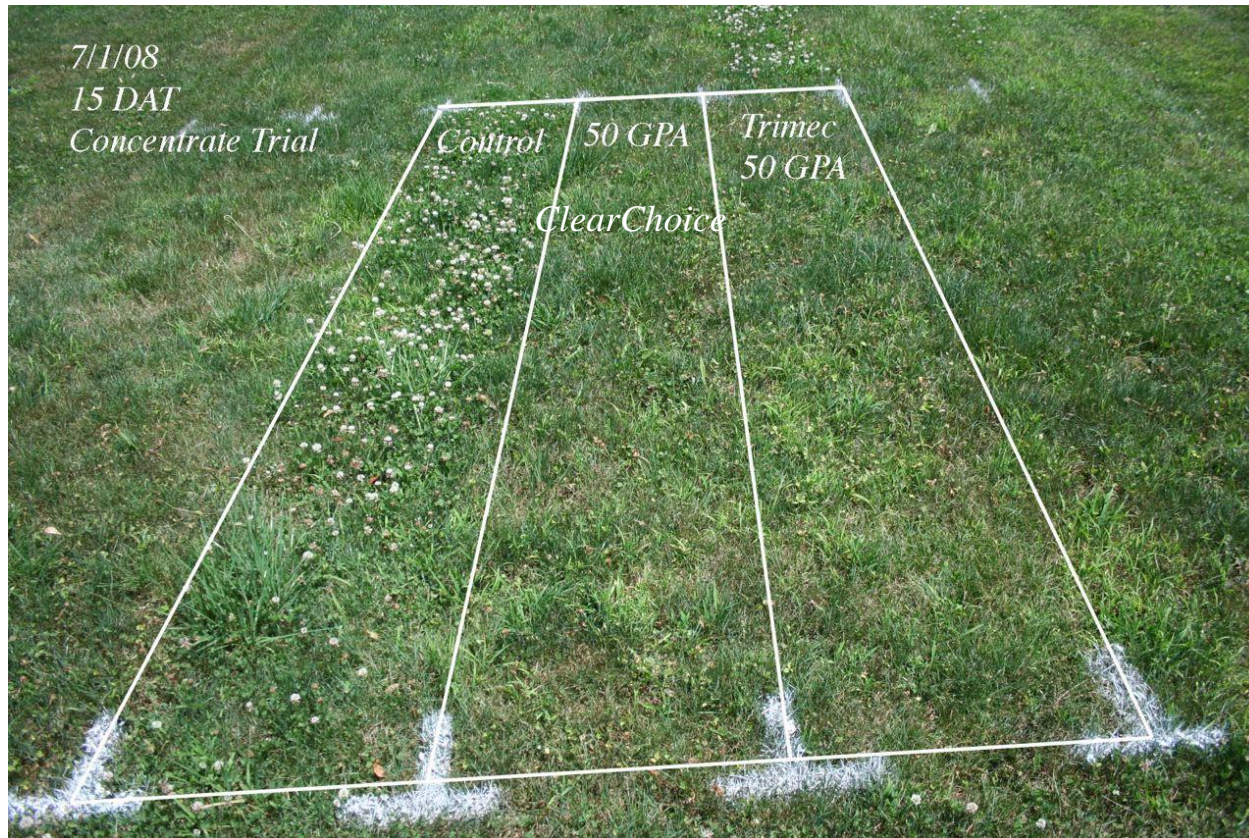


Traditional 3-way mix



Efficacy on Cool-Season Grass

Control of Clover on cool-season grass (15 DAT)



*W. Sharp and B.E. Branham, Landscape Horticulture Research Center, University of Illinois, 2008, Spring Trial

Efficacy in the treatment of Clover

Pre-treatment



Post-treatment*



* 24 DAT

University of Guelph, 2007

Efficacy in controlling Plantains

Pre-treatment



Post-treatment*



* 41 DAT

University of Guelph, 2007

Effect of CCPRO on Non-Target Trees

- ❖ Clear Choice PRO is a reduced AI herbicide that comprises 2,4-D, MCPP and Dicamba. The same active ingredients in CCPRO have been used in turf industry for decades and proved to be safe on non-target trees when applied according to label.
- ❖ Widespread damage to conifers and other trees following application of Imprelis [aminocyclopyrachlor] has heightened concerns of non-target impacts of turf herbicides.
- ❖ Study was conducted at Michigan State University in 2012 to evaluate the effects of Clear Choice PRO on non-target trees. No phyto-toxicity was observed on non-target trees. Shoot growth and needle growth was not affected ($P > 0.10$) by any of the herbicides tested. **CCPRO performed statistically the same as traditional 3-way mix (Trimec)..**

Experiment Method



- ❖ Treatments were applied in 1.3 m wide bands with a CO₂-pressurized pack-back sprayer to groundcover adjacent to rows of conifer trees and shade trees on May. Each plot included at least 10 treated trees.
- ❖ Each trial included four treatments: Clear Choice PRO @ 4 gal/ Ac, Clear Choice PRO @ 8 gal/Ac, Trimec @ 3.6 pt/Ac (positive control) and an untreated control
- ❖ Trees were evaluated on August. All trees were scored for evidence of herbicide phyto-toxicity (needle browning, stunting, twisting of shoots or needles) on a 0 – 4 scale, where 0 = no damage, 4 = severe damage.
- ❖ Trees tested including:
 - ❖ Conifer trees: white spruce (*Picea glauca*) trees, Serbian spruce (*Picea omorika*) trees, eastern white pine (*Pinus strobus*) trees
 - ❖ Shade trees: State street® maple (*Acer miyabei* 'Morton') and Harvest gold linden (*Tilia cordata* × *mongolica* 'Harvest gold').

CCPRO did not cause any phyto-toxicity on non-target trees, even when applied at the start of the annual growth flush of the trees when they are typically most sensitive to potential phyto-toxic effects

Phyto-toxicity ratings on trees					
Treatment	White Spruce	Serbian Spruce	White pine	State Street Maple	Harvest Gold Linden
Control	0	0	0	0	0
Clear Choice Pro, 4 gal/Ac	0	0	0	0	0
Clear Choice Pro, 8 gal/Ac	0	0	0	0	0
Trimec 3.6 pt/ac	0	0	0	0	0

* Product applied on May 8. Phyto-toxicity (browning, stunting, twisting of shoots or needles) were evaluated on Aug 14, on a 0 – 4 scale, where 0 = no damage, 4 = severe damage (Michigan State University, 2012)

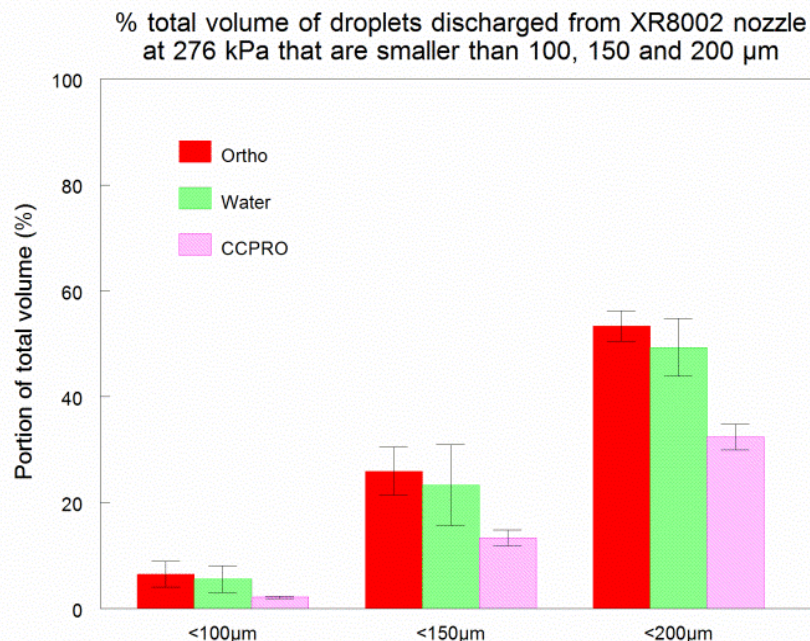
Spray Drift Study

CCPRO Spray Drift Study

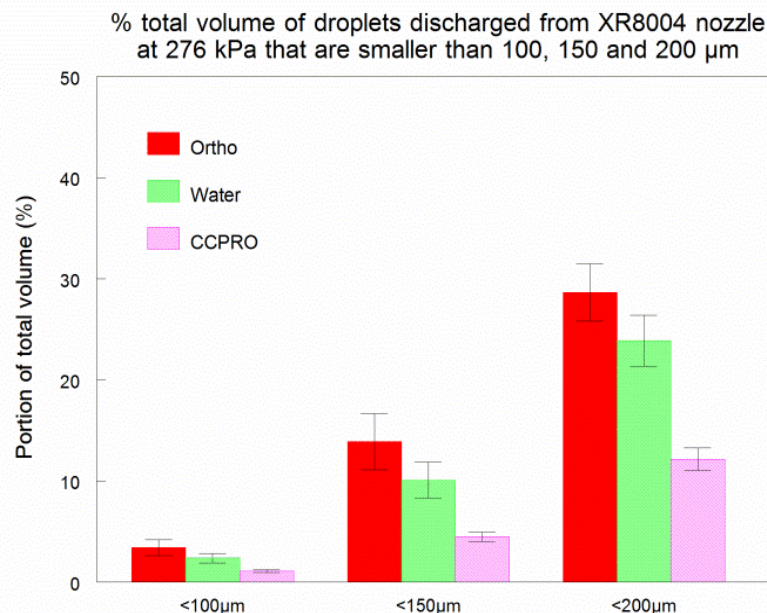
- ❖ Droplet sizes of spray solutions of water, Ortho WBG (3-way mix) and CCPRO were measured with an image particle sizing system
- ❖ Drift potential was evaluated based on particle size analysis
- ❖ Drift distances were estimated with a computer program DRIFTSIM developed by USDA-ARS
- ❖ CCPRO spray solution reduced the spray volume of small particles (100, 150 and 200 μm) considerably compared with water and Ortho WBG
- ❖ CCPRO showed less spray drift potential/drift distance
- ❖ Study was conducted at USDA-ARS
Application Technology Research Unit, Wooster, OH

Reduced spray volume of small particles from CCPRO

Less Small Particles, Less Drift Potential



(a) XR8002 Nozzle



(b) XR8004 Nozzle

Percent total spray volume of droplets that are smaller than 100, 150 and 200 μm in diameter for spray mixtures containing water, Ortho and Clear Choice PRO (CCPRO) discharged from flat-fan pattern nozzles (a) XR8002 and (b) XR8004 operated at 276 kPa pressure.

Effect on Insects

Tropical Sod Webworm in St. Augustinegrass



	Untreated	Clear Choice RTU
Lab feeding test % control		
Medium larvae	0	80%
Field test % control		
Medium larvae	0	60.76%

- Ron Cherry, University of Florida, Belle Glade, FL
- Data from “Effect of Clear Choice™ Herbicide on Tropical Sod Webworms (Lepidoptera: Pyralidae) In St. Augustinegrass”, J. Entomol. Sci. 45(1): 44-50 (January 2010)
- Trial carried out on a similar product (Clear Choice RTU).

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