Cam Wilson, Neudorff North America-January 10, 2011

Landscape Ontario-IPM Symposium

Fiesta® & Finalsan®

Alternative Weed Control Products
W. Neudorff GmbH KG

- Focused on organic/natural pesticides
- R&D on Vancouver Island
- 70+ employees
- Headquarters in Germany
- Established in 1854
- Family owned
- Effective pesticides
- Long history of developing

Neudorff
Leaders in developing low risk pesticides for Canada, US and European markets!

- Dedicated team of scientists working on low-risk pesticide products (original R&D team from SAFER)
- $1.5M investment in new research facility
• Activities in 2011
• 2010 Test Results
• Recap of 2010
• Features & Benefits
• How it Works?
• Description

Fitesta® 8 FinalSan®
Fiesta®

Lawn Weed Herbicide

Before Fiesta

After Fiesta (2 apps, 41 days)
Available in 10L and 800L sizes.

Approvals: PTRA and Ontario and NS pending.

Uses: Lawn & turf, ornamental areas including parks, playgrounds, golf, schools and areas with pesticide bans/concerns.

Use Sites: lawn & turf, ornamental areas including parks.


gt

200-400 ml/m² of solution or 0.74L of Fiestra/1000 sq ft. (200 ml rate). Note: 1L of Fiestra will treat up to 1345 sq ft.

Use rates: dilute 1 part Fiestra with 24 parts water. Spray.

Fiestra is Iron (present as FeEDTA) 4.43%.

Description: Fiestra is a selective herbicide for the control of broadleaf weeds in turf. The active ingredient in Fiestra is Iron (present as FeEDTA) 4.43%.
Check label for specifics.

Not on label: suppression of young crab grass has been observed.

- moss, liverworts, algae and lichens
- lawn burnweed
- dandelion
- narrow-leaved plantain
- broad-leaved plantain
- slender speedwell
- creeping buttercup
- common chickweed
- Canada thistle
- bull thistle
- black medic
- white clover
- false dandelion
- English daisy
- dandelion

WEEDS CONTROLLED OR SUPPRESSED
Adequate coverage is important.

Selectivity.

Grasses (monocots) which provide the mechanism of black/brown.

Broadleaf weeds (dicots) absorb more iron than contacted least tissue cells occurs turning the leaves transported down to the root. As well, toxicity at the least tissue and transferred is quickly absorbed by the least tissue level.

Iron toxicity (oxidative damage) at the cellular level.

How it works?
<table>
<thead>
<tr>
<th>Substance</th>
<th>Oral LD50 (Rat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caffeine</td>
<td>192</td>
</tr>
<tr>
<td>Lime Sulfur</td>
<td>820</td>
</tr>
<tr>
<td>Borax</td>
<td>2400</td>
</tr>
<tr>
<td>Table Salt</td>
<td>3000</td>
</tr>
<tr>
<td>Vinegar</td>
<td>3510</td>
</tr>
<tr>
<td>FeHEDTA</td>
<td>&gt;5000</td>
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</tbody>
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Features & Benefits

- People and pets can re-enter area after spray dries.
- Stable formula. Will not freeze. No special handling required.
- Rain-fast in 3 hours.
- Works fast. See results in > 24 hours.
- Works in wide temperature ranges (10°C-25°C/50°F-85°F).
- Kill's a wide range of broadleaf weeds.
- Approved for use in Ontario.
Few cases on FIESTA staining wooden fencing and decks.

Product entered market.

Small amounts of illegal, non-registered (FIESTA knock-off) weeks apart was needed.

For most large, well established weeds 2 applications 4 sprays/1000 sq ft (0.74 L of Fiesta/1000).

Typical rate used was 200 ml of spray/m² or 1.5 L at.

First FIESTA applied in Ontario 3rd week of May.

FIESTA Recap of 2010

Received Ontario approval April 30, 2010.
Knock-off Product

Neudorff and PMRA staff are tracking/reporting illegal uses.

and/or customers.

Liability insurance in case of accidental exposure to workers

Use of illegal product could actually void a company’s

In turn.

Canada and approved in Ontario to control broadleaf weeds

Fiesta is the only iron based herbicide registered in

labeled for such use.

A product for pesticidal purposes unless it is specifically

According to the PMRA it is illegal to distribute, sell or use a

Fiesta
- Comparing high and low label rates.
- Rate reduction trials.
- Turt safety trials.
- Control of rust in turt with FIESTA.
- Stain removal trials from overspray.

2010 Trial Work

FIESTA
Fiesta Staining-Removed with Thompson’s Deck Cleaner

Wood Staining - Removed with Thompson’s Deck Cleaner

Stain Rating: 1 = no visible stain, 2 = noticeable stain, 3 = severe stain residues

(Fiesta stained on different wood surfaces)
Thomposon's Deck Cleaner
Cleaned with 2 times of
Sprayed with FIESTA 100 ml/s/m²
Douglass Fir
Larch
Oak
After cleaning
Before cleaning
Wood Staining-Removed with Thomposon's Deck Cleaner
FIESTA
Days After Treatment

Observed Rust Disease

0-2

0

0.5

1

1.5

2

Rust Disease: 0=no apparent symptoms, 2=rust readily apparent

Control of rust on greenhouse Kentucky bluegrass with one application of

RUST

FIESTA

FIESTA

Neudorff
Goal: to determine the # of apps of FIESTA and timing between apps to avoid potential turf damage.

- Kentucky blue, fine fescue and perennial rye tested.
- At 8 apps/season slight thinning of the turf was observed.

Photo: perennial rye after 1 app.
Turf Safety Trials

Turf Performance Characteristics for Kentucky Bluegrass at G1 (Guelph, ON)

Visual Rating (0-10)

- Density
- Quality
- Colour

*Phytotoxicity measured zero for all treatments throughout the trial.
Turf Safety Trials

Fiesta

Neudorff

(Visual Rating 0-10; 10 = best colour, quality or density*)
Turf Performance Characteristics for perennial ryegrass at GTI (Guelph)

(Visual Rating 0-10: 10 = best quality or density)

QUALITY

DENSITY
Control of small dandelion, false dandelion and English daisy.

Conclusion: 2 apps @ 100 ml/m² hold promise for the PMRA and further testing and approval is required.

Note: These sub-label rates are not yet approved by the diameter.

could control/suppress small broadleaf weeds (> 1.0 cm in goal: to determine if FIESTA rates, less than label rates

Rate Reduction Trials

FIESTA
Daisy
Apart controlled Small English
2 apps of 100 ml/m2 24 days

Mean % Control

Different rates of Fiesta
Control of English daisy in the field with

Fiesta
Vancouver Island 2010
Control of False Dandelion with different rates of Fiesta

Vancouver Island 2010
Control of dandelion in turf with two applications of Fiesta

California 2010

Fiesta

Neudorff
Control of white clover in turf with two applications of Fiesta

- Fiesta 200 ml/m²
- Fiesta 400 ml/m²
- Commercial std.
- Untreated

Days After Treatment:
- 1
- 3
- 7
- 14
- 24
- 32
- 40
- 54

2,4-D + MCP + dicamba
Control of Canada thistle in turt in Oids, Alberta (2010)

Weed Injury Rating: 1-5: 1 = no visible injury, 5 = weed appears dead
Further trial work to expand weeds on label.
- Review supply chain to reduce Fiestra costs.
- Further studying studies on common trenching/deck materials.
- Stop the illegal knock-off products that compete with Fiestra.
- Will attempt to revise label to include lower rates.
- Building FIESTA inventory for early order program.

Activities in 2011
untreated

24 hours after Finalsan

FINALSAN®

Grass & Weed Killer

NEUDORFF®
Available in 5L & 10L sizes.

Approvals: PMA and OAIC. Most provinces/municipalities.

Use sites: Around and within gardens, landscaped, around buildings.

Algae on roofs, decks, fences, walkways, driveways and sidewalks.

Moss: Dilute 1 part Finalsan with 19 parts water and spray. 100-500 ml/2 m² (1L of Finalsan will treat ~2, 150 sq. ft.).

Grass/Weeds: Dilute 1 part Finalsan with 5 parts water and spray. 100-200 ml/2 m² (1L of Finalsan will treat ~650 sq. ft.).

Use rates: 1.5% - 2.0%.

Description: FINALSAN is a non-selective burn-down herbicide for the control of grass, weeds, moss & algae. The active ingredient is ammonium salts of fatty acids. 22.10%.

REG NO. 29017 PCP ACT
Features & Benefits

Non-corrosive
Non-staining
Rain-fast in 3 hours
Works in wide temperature ranges (10°C or higher)
Areas can be re-sown 5 days after treatment
Works fast Kills within hours
Kills/suppresses most vegetation
Biodegradable
Approved for use in Ontario
After 24 hours, death, and eventually cell death causing wilt surfaces of leaf. Finalsan breaks within minutes. Cross section of leaf surface.

Mode of Action

FINALSAN
Acetic acid std.

Control
Top Gun: 2.8% a.i.
Fricidil: 10.2% a.i.
Finalsan: 3.5% a.i.

(Plant Damage: 1=no damage, 5=complete kill)

Control of common dandelion

Germany 2008

FINALSAN

NEUDORFF
Control of white clover with organic herbicides

Vancouver Island 2008

FINALSAN

CAUTION/DANGER Signal words

EcoClear is CAUTION/DANGER signal words
FinaLsan does not stain

Vancouver Island 2000
Time after Treatment

Herbicide

Control of annual bluegrass, P. annua, with one application of

California 2010

FinalSAN

Neudorff
Fiesta® & Finalsan®

• Approved for use within Ontario ban.
• Proven effective.
• Fast acting—see results in hours.
• Rain-fast in 3 hours.
• Work in cool and warm weather.
Most importantly the end-users!

Our distributors

Guelph Turfgrass Institute

Landscape Ontario

Thanks!