Cornell Cooperative Extension
Vegetable Program

Exciting New Registrations for Pest Management in Onions

Christy Hoepting
Cornell Cooperative Extension Vegetable Program

Outline

- New Seed Treatments for Onion Maggot
  - Resistance management strategy
  - Fungicide components
- Actigard
- Inspire Super
- Quadris Top
- Dual Magnum

New Seed Treatment for Onion Maggot

Sepresto®

- Combination of two neonicotinoids
  - 3:1 ratio of clothianidin (same active as Poncho) and imidacloprid (same active as Gaucho and Admire).
- Controls seedcorn maggots
- **Available exclusively on Nunhem's onion varieties**
  - ie. Hendrix and Pulsar
- Only as part of a seed treatment package: "CAPS"
  - "C"=Coronet, "A"=Allegiance, "P"=Pro Gro and **"S"=Sepresto**

Farmore® FI500

	Farmore® 300	Farmore® FI400	Farmore® FI500
ACTIVE INGREDIENT	3 fungicides: Mefenoxan Fludioxonil Azoxystrobin	Thiamethoxam (same as Crusier, Platinum, Actara)	Thiamethoxam + spinosad
FOR CONTROL OF	Soil-borne pathogens	Beetles Aphids	Onion Maggot Seed Corn Maggot
LABELED FOR USE ON	Several Crops	Cucurbits Leafy Brassicas Carrots	Onions, all varieties

How Do Sepresto & Farmore FI500 Stack Up?

How Do Sepresto & Farmore FI500 Stack Up?

B. Nault *et al.* (Cornell University) 2004 to 2009

Rank	Insecticide *(a.i)*	No. of Trials	Average OM control	Comments
1	Regent*/Mundial ST[1]*	12	94%	Provided significantly better control than Trigard 38.5% of the time
2	Trigard ST + Lorsban IF[1]	11	90%	Provided significantly better control than Trigard alone 36% of the time
2	Poncho*/Sepresto ST	13	90%	
3	Entrust*/Regard ST*	17	88%	
4	Farmore FI500	1[2]	81%	Trial conducted under very high pressure. Trigard provided 80% and Sepresto 74% control in this trial
5	Avicta ST*	4	81%	Also controls nematodes
6	Trigard ST	15	80%	Did not provide significant control over untreated 6% of the time
7	Lorsban IF	14	68%	Did not provide significant control over untreated 14% of the time
8	Gaucho*	1	31%	Did not provide control of onion thrips in NY
9	Cruiser*	1	20.6%	Did not provide control of onion thrips in NY

[1]ST- seed treatment, IF-in-furrow treatment. [2]trial conducted by C. Hoepting, 2010. *not labeled for use on onion

Resistance Management

- Onion maggot is notorious for developing resistance
  - Organochlorines,
  - Carbamates and OPs, including Lorsban
  - Trigard (resistance never confirmed, but efficacy noticeably declined in many fields)
- Onion maggot can develop resistance within 4-5 years of continuous exposure

Resistance Management

- Once resistance has developed
  - Population can become controllable after eliminating exposure for a few years
  - Resistance will occur faster with resumed continuous exposure
- Lack of interest from chemical companies to pursue registrations for onion maggot control.
  - Imperative to preserve the useful life of Sepresto and Farmore FI500.

Insecticide Roster for Onion Maggot in NY: 2012

Trade Name	Company	Active Ingredient for OM	Chemical Class (IRAC[2] group)	Application
Diazinon AG500 Diazinon 50WP Etc.	Makhteshim	diazinon	OP **(1)**	Pre-plant broadcast & incorporate
Lorsban 4E, 75WG, Advanced and OLF[1]	Dow AgroSciences (Lorsban), other companies for OLF	Chlorpyrifos	OP **(1)**	At planting in-furrow, Post-planting banded spray over row
Trigard	Syngenta	Cyromazine	Triazine **(17)**	Seed treatment
Sepresto	Bayer Crop Sciences	Clothianidin + imidacloprid	Neonicotinoid **(4)** + Neonicotinoid **(4)**	Seed treatment
Farmore FI500	Syngenta	Thiamethoxam + spinosad	Neonicotinoid **(4)** + Spinosyn **(5)**	Seed treatment

OLF: other labeled formulation such as Warhawk. [2]**IRAC**: Insecticide resistance action committee

Resistance management

Follow a resistance management strategy

- Rotate among chemical classes on all acreage every year
- Sepresto on Nunhem's varieties only
  - Rotate the ground from year to year that is cropped to Nunhem's varieties
  - Use Sepresto every other year
  - Do not use Lorsban in-furrow in combination with Sepresto seed treatment.

Onion Maggot Rotation Plan

	Field 1	Field 2	Field 3	Field 4
2012	**Trigard (Lorsban IF)**	**Trigard (Lorsban IF)**	**Sepresto (Nunhems Varieties)**	**Farmore FI500 (+ & - Lorsban)**

- Continue to use Sepresto on Nunhem's varieties (rotate ground that had Sepresto/Nunhem's in 2011)
- Experiment with FI500 on as much acreage as you feel comfortable
  - Side by side comparisons with & without Lorsban
- Remaining acreage: Trigard (+Lorsban IF)

Reminder! Add Pro Gro for smut to Trigard & Farmore FI500

Onion Maggot Rotation Plan

	Field 1	Field 2	Field 3	Field 4
2012	Trigard (Lorsban IF)	Trigard (Lorsban IF)	Sepresto (Nunhems Varieties)	Farmore FI500 (+ & - Lorsban)
2013	Farmore FI500 (+ & - Lorsban)	Farmore FI500 (+ & - Lorsban)	Farmore FI500 (+ & - Lorsban)	Sepresto (Nunhems Varieties)

- Farmore FI500 on all acreage (except Nunhem's varieties, ideally on Farmore FI500 acreage)
- Verdict will be in on need for Lorsban

Reminder! Add Pro Gro for smut to Trigard & Farmore FI500

Onion Maggot Rotation Plan

	Field 1	Field 2	Field 3	Field 4
2012	Trigard (Lorsban IF)	Trigard (Lorsban IF)	Sepresto (Nunhems Varieties)	Farmore FI500 (+ & - Lorsban)
2013	Farmore FI500 (+ & - Lorsban)	Farmore FI500 (+ & - Lorsban)	Farmore FI500 (+ & - Lorsban)	Sepresto (Nunhems Varieties)
2014	Trigard (Lorsban IF)	Trigard (Lorsban IF)	Trigard (Lorsban IF)	Trigard (Lorsban IF)

- Trigard (+ Lorsban IF) on all acreage

Reminder! Add Pro Gro for smut to Trigard & Farmore FI500

Onion Maggot Rotation Plan

	Field 1	Field 2	Field 3	Field 4
2012	Trigard (Lorsban IF)	Trigard (Lorsban IF)	Sepresto (Nunhems Varieties)	Farmore FI500 (+ & - Lorsban)
2013	Farmore FI500 (+ & - Lorsban)	Farmore FI500 (+ & - Lorsban)	Farmore FI500 (+ & - Lorsban)	Sepresto (Nunhems Varieties)
2014	Trigard (Lorsban IF)	Trigard (Lorsban IF)	Trigard (Lorsban IF)	Trigard (Lorsban IF)
2015	Sepresto (Nunhems Varieties)	Farmore FI500 (+ & - Lorsban)	Farmore FI500 (+ & - Lorsban)	Farmore FI500 (+ & - Lorsban)

Make sure you have Onion Smut Protection!

Make sure you have Onion Smut Protection!

- Nunhem's Sepresto seed treatment package (CA**P**S) includes **P**ro Gro
- Farmore FI500 does not provide control of onion smut – add Pro Gro
- Mancozeb in-furrow is still recommended in addition to both of these seed treatments for adequate onion smut control.

Fungicide Seed Treatment Package: Nunhem's CAPS'

Trade Name	Active Ingredient	FRAC[3] group	Disease Controlled		
			Onion Smut	Damping Off	Other
Coronet[1] (BASF)	Pyraclostrobin + boscalid	11 7	No	Yes: *Rhizoctonia solani*	*Botrytis allii Aspergillis spp. Penicillium spp.*
Allegiance (Bayer)	Metalaxyl[2]	4	No	Yes: *Pythium spp.*	*Fusarium spp.*
Pro Gro (Chemtura)	Thiram + carboxin	M3 7	~ 44% control[4]	Yes: *Pythium spp.*	*Botrytis allii Penicillium spp.*
Sepresto (Bayer)	Clothianidin + imidacloprid	Insecti-cides	For onion maggot control (~90% control)		

[1]same actives as Pristine. [2]metalaxyl = mefanoxam (Apron). [3]FRAC: Fungicide resistance action committee. [4]for 80%+ control of onion smut, include mancozeb in-furrow with Pro Gro treated seed.

Fungicide Seed Treatment Package: Farmore FI500

Trade Name	Active Ingredient	FRAC[1] group	Disease Controlled		
			Onion Smut	Damping Off	Other
Apron	Mefanoxam	4	No	Yes: *Pythium spp.*	
Maxim	Fludioxonil	12	No	Yes: *Rhizoctonia solani*	*Fusarium spp.*
Quadris	Azoxystrobin	11	No	No	
Regard	Spinosad	Insecticide	No	For onion maggot control	
Crusier	Thiamethoxam	insecticide	No	Does not control onion maggot	

[1]FRAC: Fungicide resistance action committee.

New Fungicide Registrations in Onions in New York

Actigard, Syngenta

- a.i. acibenzolar-s-methyl
- Non-pesticidal compound and inducer of plant resistance
- Suppression of **Iris Yellow Spot Virus, Xanthomonas leaf blight (bacterial disease)** and **Downy Mildew**
- 0.75 – 1 oz 2-4 weeks pre-bulb for bacterial disease and 4-6 weeks pre-bulb for IYSV
- Maximum 4 oz per season

Does Actigard work?

Actigard

Colorado: Schwartz 2000-2004

Xanthomonas Leaf Blight

- Actigard reduced disease 29-40% compared to weekly copper/EBDC spray

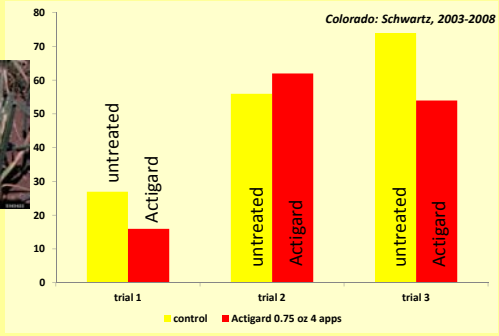
Downy Mildew:

- Compared to untreated, reduced incidence by 25%

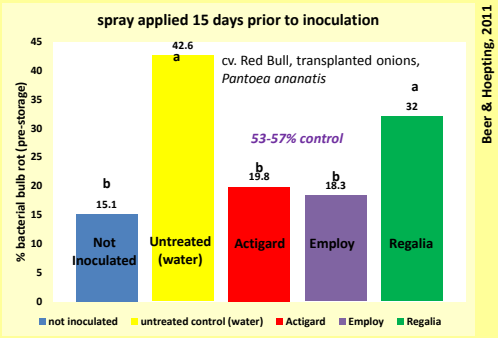
Yield:

- 10 consecutive sprays did reduce yield in CO
- 13 consecutive sprays did not reduce yield in NY
- no effect on yield with 4 sprays

Actigard: IYSV



Induced Resistance Inoculated Field Trial: Elba, NY 2011



New Fungicide Registrations for Onions in New York

Inspire Super, Syngenta

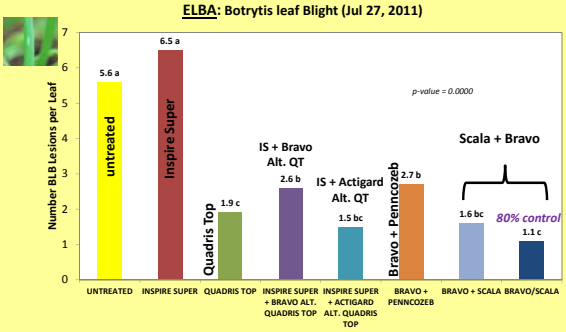
- a.i. difenoconazole (FRAC group 3) = Inspire + cyprodinil (FRAC group 9) = Vangard
- Control of **PB**, **BLB**, suppression of **black mold**
- Use with an **adjuvant** such as Induce
- Make **no more than 2** sequential applications before switching to a different mode of action
- **Cannot be used as rotation partners:**
  - Scala (9), Switch (9+12), Vangard (9), Tilt (3), Quilt Xcel (3+11), Quadris Top (3+11)

New Fungicide Registrations in Onions in New York

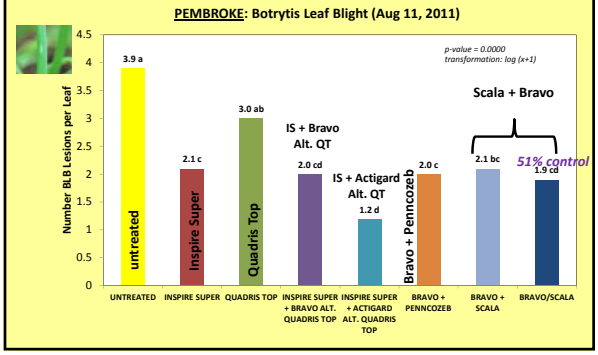
Quadris Top, Syngenta

- a.i. azoxystrobin (FRAC group 11) = Quadris + difenoconazole (FRAC group 3) = Inspire
- Control of PB/SLB and BLB
- Make no more than **1** sequential applications before switching to a different mode of action
- **Cannot be used as rotation partners:**
  - Tilt (3), Quilt Xcel (3+11), Quadris (11), Pristine (11+7), Cabrio (11), Inspire Super (3+9)

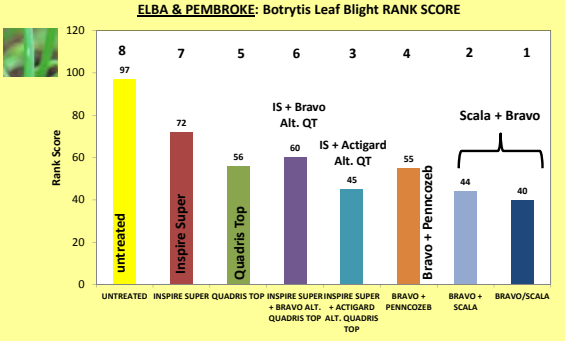
Inspire Super & Quadris Top in New York: Hoepting 2011



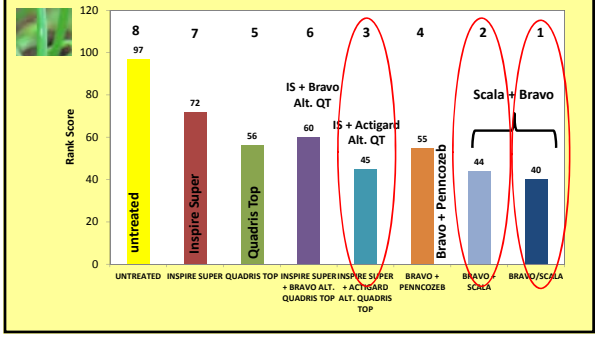
Inspire Super & Quadris Top in New York: Hoepting 2011



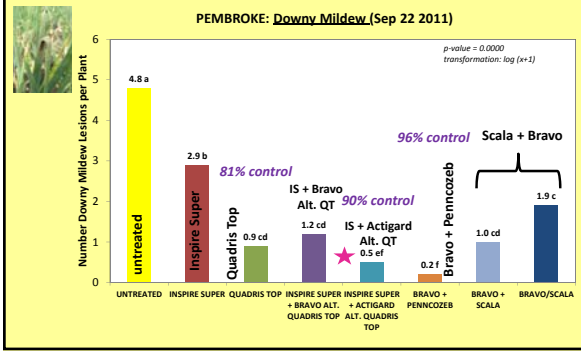
Inspire Super & Quadris Top in New York: Hoepting 2011



Inspire Super & Quadris Top in New York: Hoepting 2011

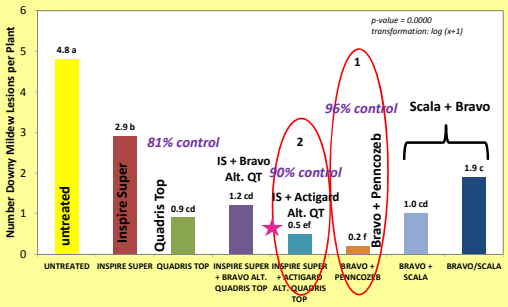


Inspire Super & Quadris Top in New York: Hoepting 2011



Inspire Super & Quadris Top in New York: Hoepting 2011

PEMBROKE: Downy Mildew (Sep 22 2011)



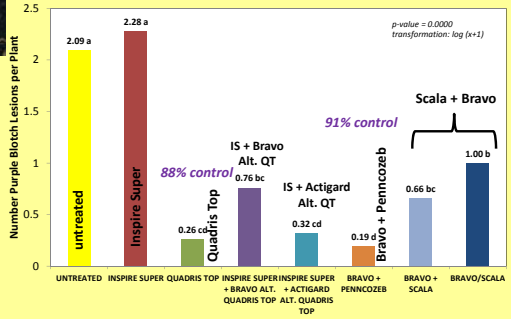
Downy Mildew

Downy Mildew is Chased by Purple Blotch

Downy mildew is invaded by secondary pathogens including Purple Blotch

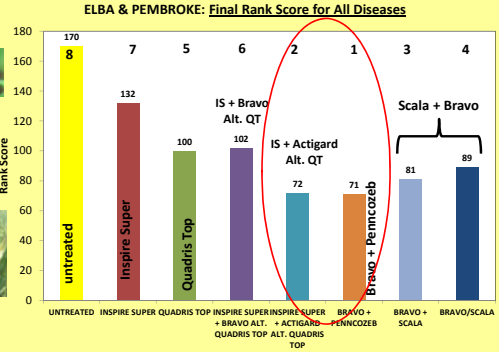
Inspire Super & Quadris Top in New York: Hoepting 2011

PEMBROKE: Purple Blotch (Sep 22, 2011)



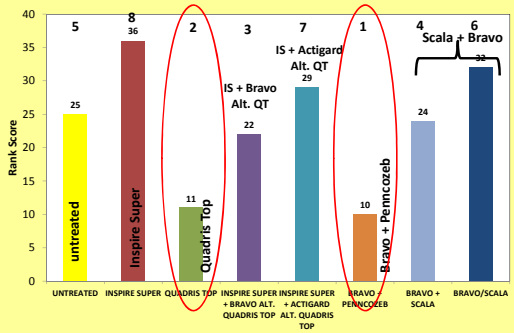
Inspire Super & Quadris Top in New York: Hoepting 2011

ELBA & PEMBROKE: Final Rank Score for All Diseases

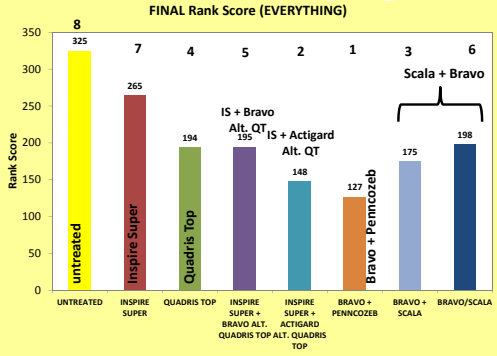


Inspire Super & Quadris Top in New York: Hoepting 2011

PEMBROKE: Rank Score for Plant Health & Yield



Inspire Super & Quadris Top in New York: Hoepting 2011



Summary

- Do not use Inspire Super alone
- Mancozeb applied preventatively provides good control of downy mildew
- Actigard included in the tank mix appeared to enhance control of all leaf diseases
  - Especially downy mildew
- Quadris Top appears to have a good fit in the onion leaf disease spray program
  - Plant health
  - Suppression of downy mildew
- Be mindful of rotation restrictions with Inspire Super and Quadris Top

Rotation Sequence for Inspire Super & Quadris Top

1. **Bravo** (M5) for BLB on small onions for first 1-2 sprays.
2. **Inspire Super** (3+9) **+ Bravo** (M5) for BLB + PB for 2 consecutive sprays.
3. **Bravo** (M5) for BLB **or Rovral** (2) for BLB + PB for 1 spray.
4. **Quadris Top** (11+3) **+ Bravo 1.5 pts** (M5) for PB + BLB for 1 spray.*
5. **Rovral** (2) for BLB + PB for 1 spray.
6. **Inspire Super** (3+9) **+ Bravo** (M5) for BLB + PB + suppress Black Mold for up to 2 sprays.

*If spray season is short, skip #4 and #5 and go straight to #6 in sequence.

New Fungicide Registrations in Onions in New York

Quilt Xcel, Syngenta

- a.i. azoxystrobin (FRAC group 11) = Quadris + propiconazole (FRAC group 3) = Tilt
- Control of PB (low rates) and BLB & DM (high rates)
- Make no more than **1** sequential applications before switching to a non-group 11 fungicide
- **Cannot be used as rotation partners:**
  - Quadris (11), Quadris Top (11+3), Pristine (11+7) and Cabrio (11).

New Fungicide Registrations in Onions in New York

Presidio, Valent

- a.i. fluopicolide (FRAC group B5)
- Control of **downy mildew (DM)**
- **Apply only in a tankmix** with another labeled fungicide with a different mode of action (i.e. mancozeb)
- Make no more than **2** sequential applications before switching to a different mode of action

New Herbicide Registration in Onions in New York

Dual Magnum, Syngenta

- a.i. metalochlor for yellow nutsedge control
- Section 24 (c) Special Local Needs (indemnified)
- Apply Dual Magnum up to 1.33 pt as late as possible in the fall before the ground freezes.
- Incorporate Dual Magnum to a shallow depth of no greater than 4 inches
- In the following spring, do not disturb soil below the depth of Dual Magnum incorporation – this could drastically reduce the efficacy of Dual Magnum

New Herbicide Registration in Onions in New York

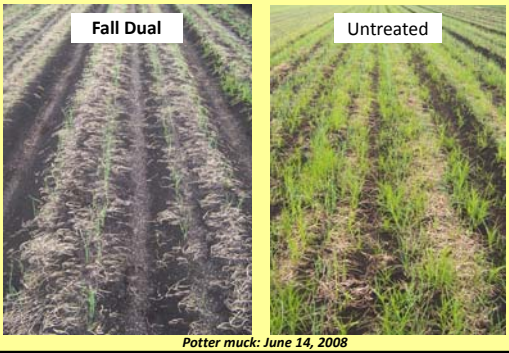
Dual Magnum, Syngenta

- Be aware that fall applications of Dual Magnum may cause reduced stand and plant size in the following crop.
- Enjoy significantly reduced yellow nutsedge pressure and possibly higher onion yields

Fall-Applied Dual Magnum

Webster muck: June 14, 2008

Fall-Applied Dual Magnum



Potter muck: June 14, 2008

Questions?

For more information, contact Christy Hoepting
585-721-6953; cah59@cornell.edu