TACKLING TOUGH CORN DISEASES IN EASTERN NEBRASKA

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JIM HARBOUR - FUNGICIDE TRIALS




EXTENSION

NORTHERN CORN LEAF BLIGHT

- Caused by a fungus
- Developed early in 2015 on V7 corn in east central Nebraska
- Medium/large (cigar-shaped) lesions with rounded ends
- Older lesions may look dark or dusty in middle = spores
- Overwinters in crop debris
- Favored by cool/moderate temps (64-80 F) and dampness
- Most common and severe in eastern Nebraska

Dark sporulation

EXTENSION

Northern Corn Leaf Blight (NCLB)

MANAGEMENT for 2016

- Resistant hybrids
- Foliar fungicides
- Crop rotation
- Tillage

GRAY LEAF SPOT

- Caused by a fungus
- Rectangular lesions
- Will overwinter in crop debris
- Favored by warm temps (70-90 F) and high relative humidity - >95% for 11+ hrs
- Develops in lower leaves first and progresses higher on plant as favorable conditions persist
- Manage with resistance, rotation, tillage, fungicides

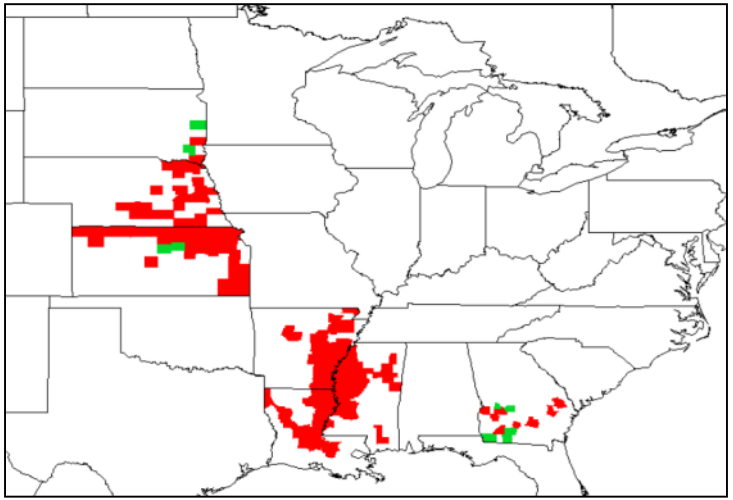
EXTENSION

SOUTHERN RUST DISTRIBUTION

NOTES: scr.ipmpipe.org/

- Not all states participate
- Counties shaded in red indicate that southern rust confirmed (by microscope) on at least 1 sample
- Unshaded counties are not necessarily free of the disease – must receive sample for lab confirmation

As of November 9, 2015



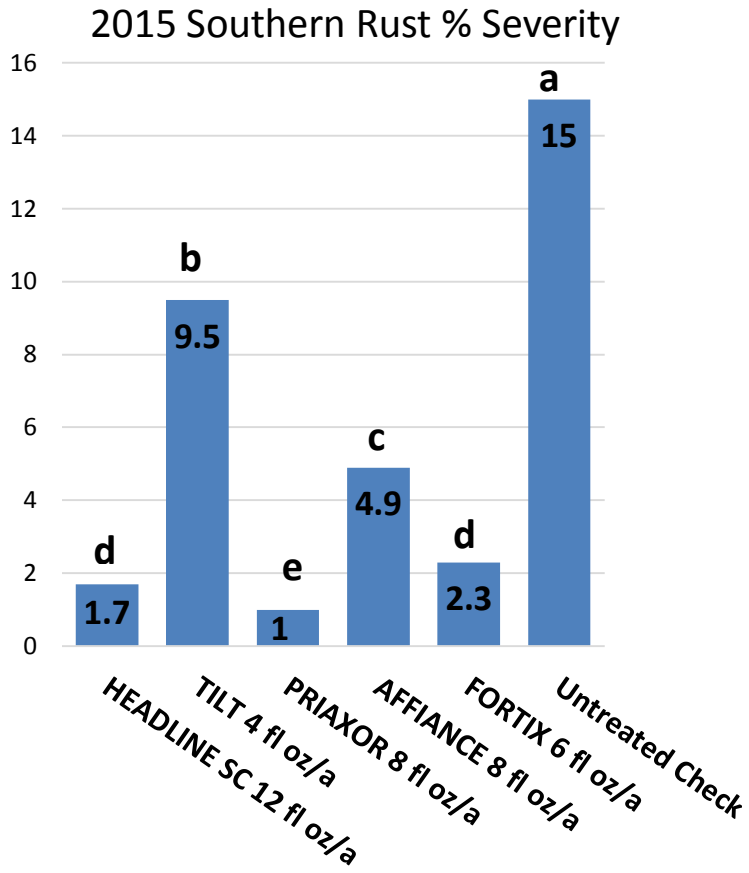
EXTENSION

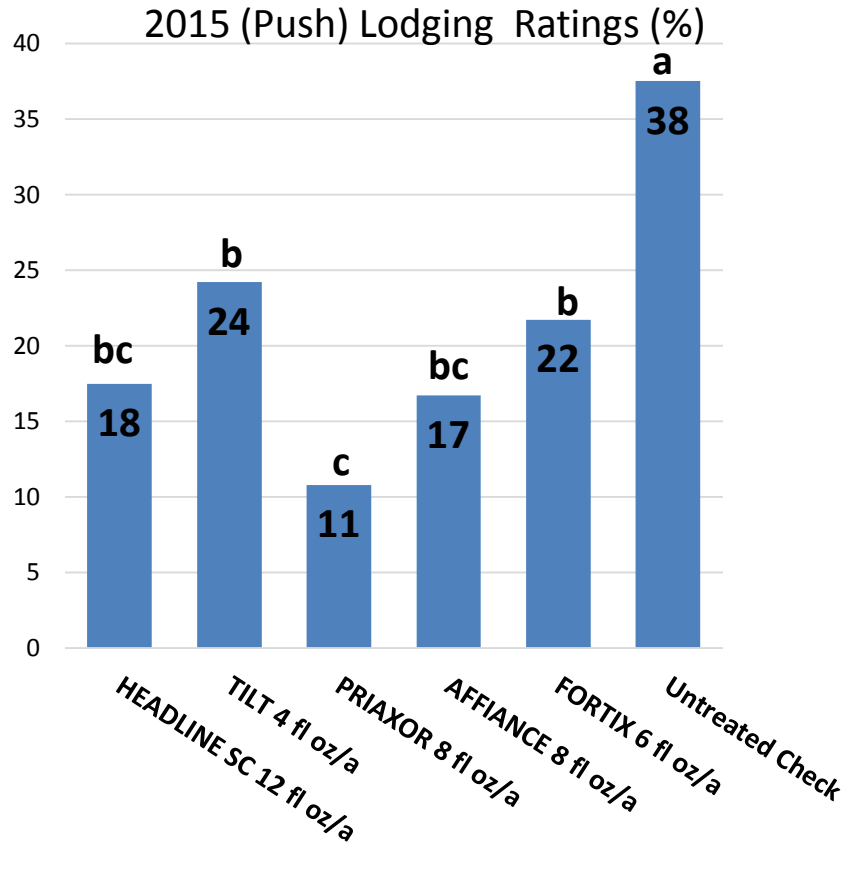
SOUTHERN RUST

- Look for orange/tan pustules mainly on top side of leaf
- Spores will rub off
- Often have haloes around pustules
- 2015 disease
  - High incidence, but low severity likely due to cooler temperatures

EXTENSION

Various Fungicide Modes of Action Applied at R2 (Blister) vs. Southern Rust





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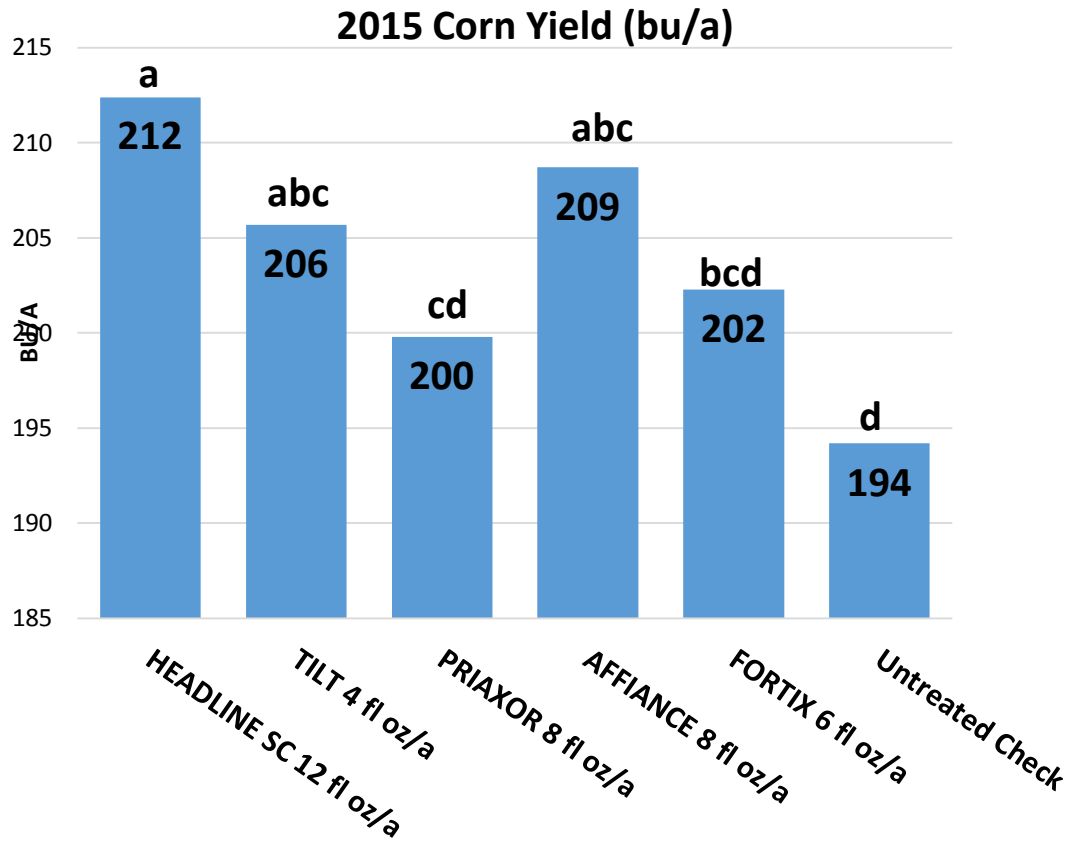

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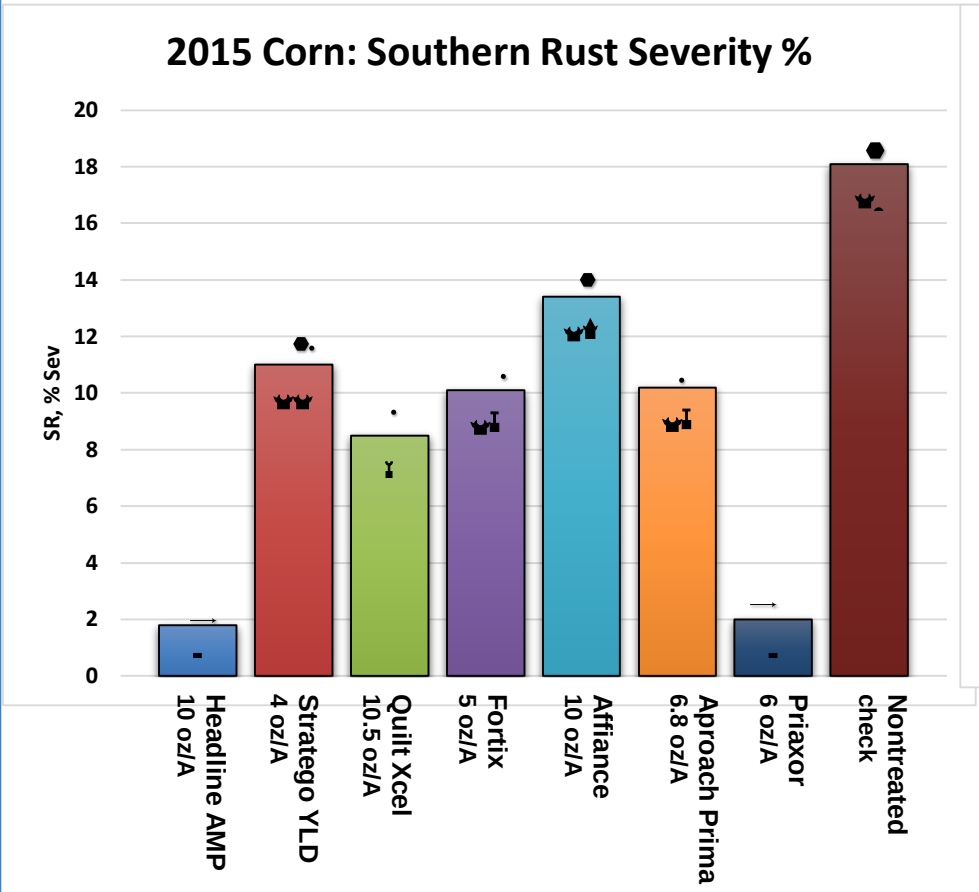

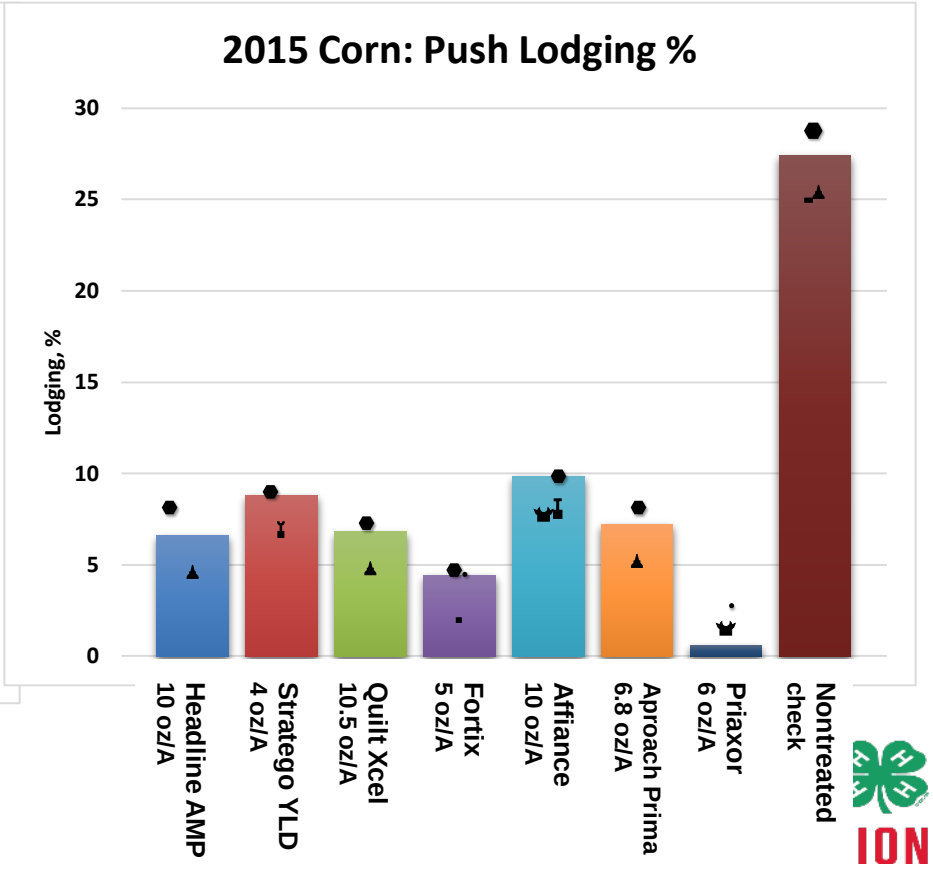

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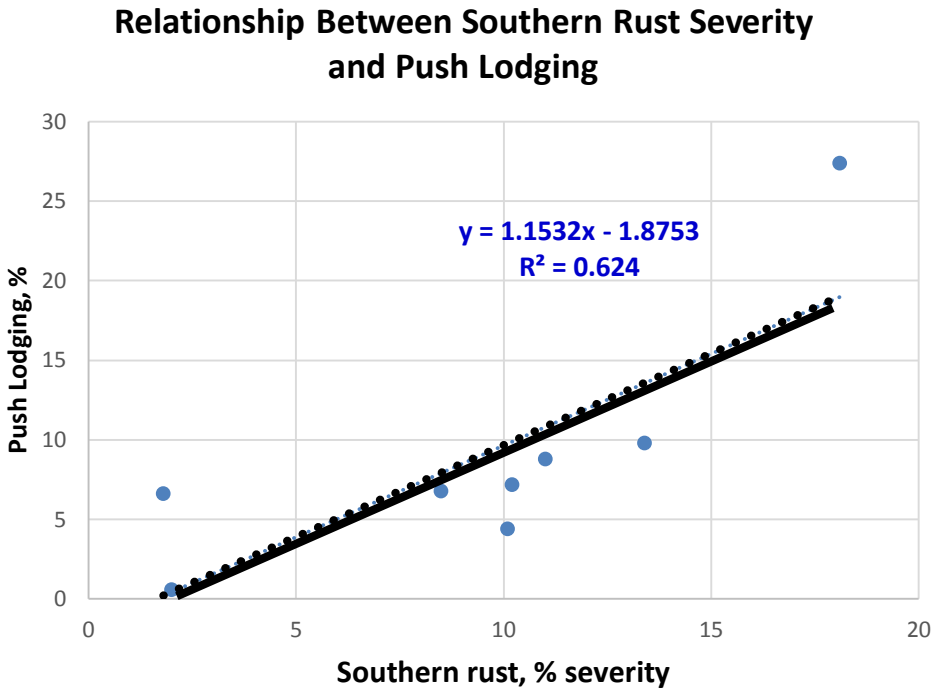
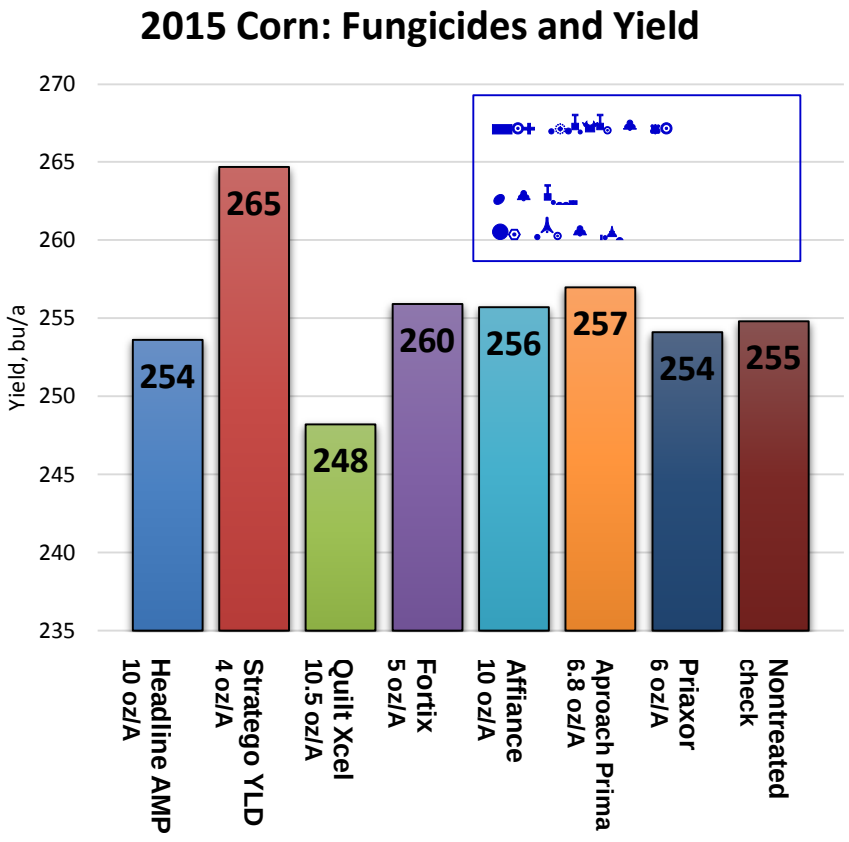
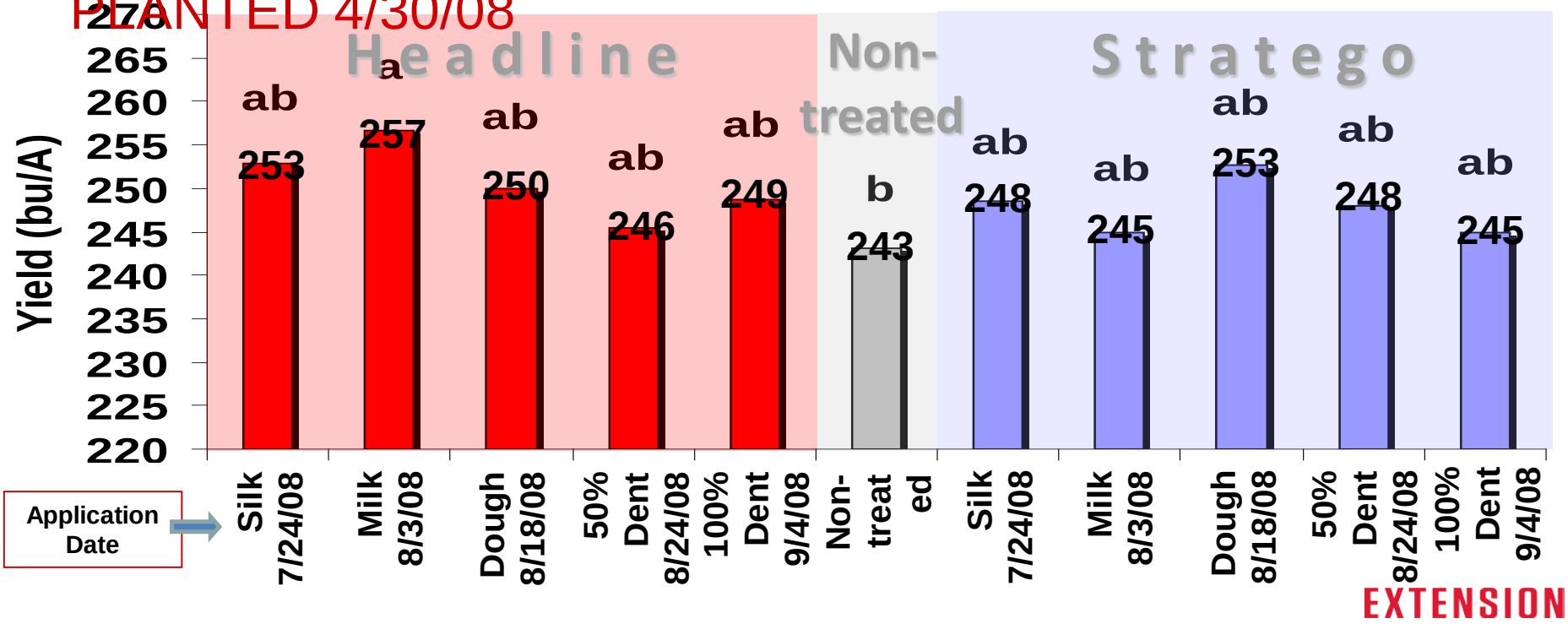




2008 FUNGICIDE TIMING TRIAL IN NE

DKC 60-18 (GLS RATING = 7/FAIR)

PLANTED 4/30/08



EXTENSION

2008 FUNGICIDE TIMING TRIAL IN NE

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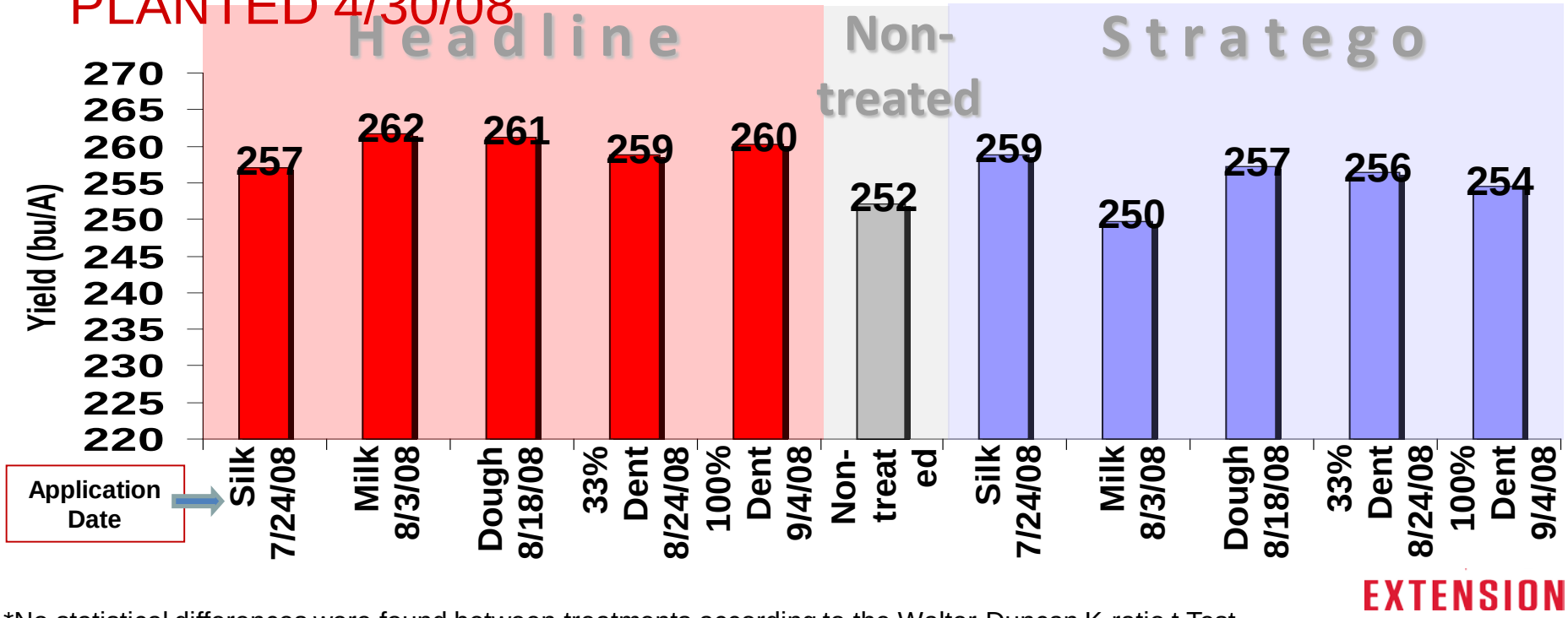

EXTENSION

*No statistical differences were found between treatments according to the Walter-Duncan K-ratio t Test.

2008 FUNGICIDE TIMING TRIAL IN NE

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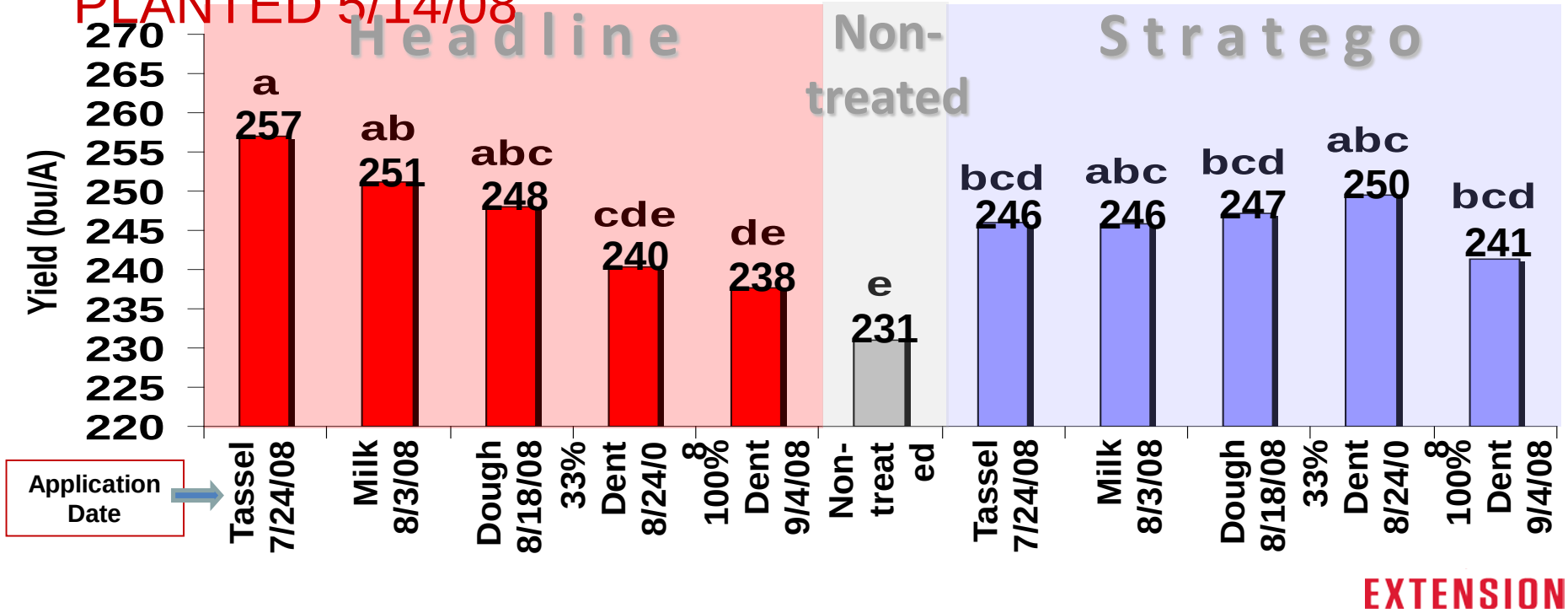

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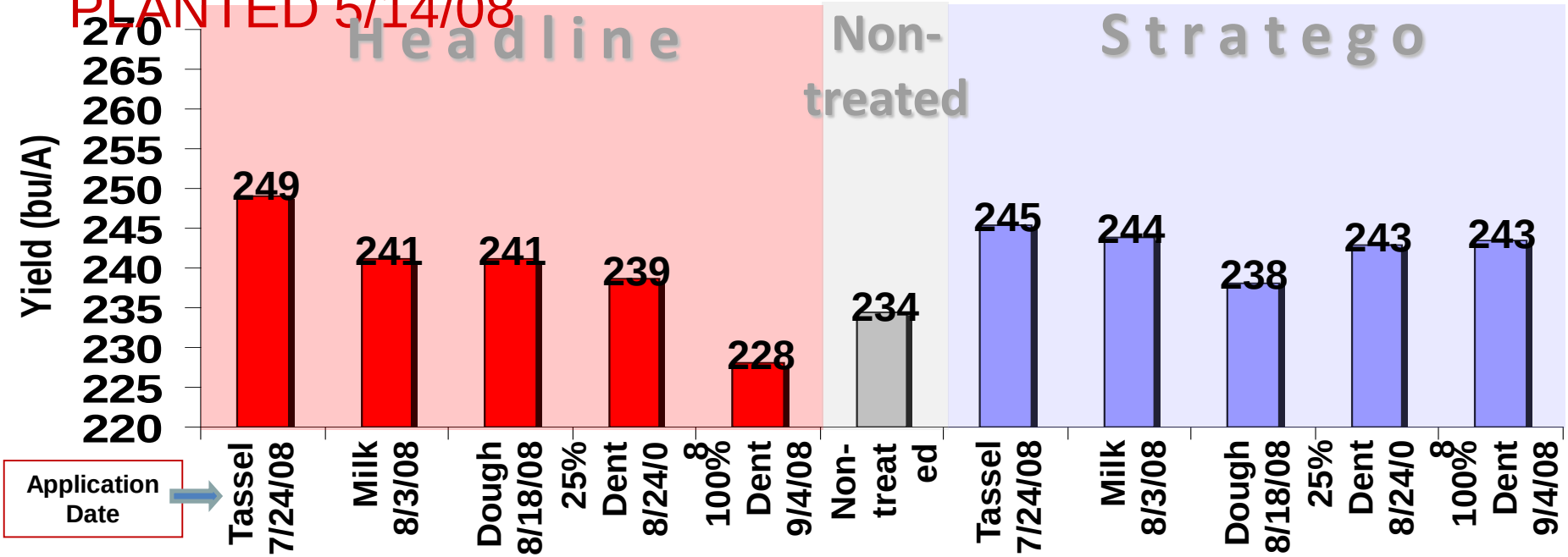

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DENT (R5) SUBSTAGES AND KERNEL DRY MATTER ACCUMULATION

R Stage	% Moisture	Dry Matter (% of Total Dry Weight)	Avg GDD	Avg # Days
5.0	60%	45%	75	3
5.25 (1/4 milk line)	52%	65%	120	6
5.5 (1/2 milk line)	40%	90%	175	10
5.75 (3/4 milk line)	37%	97%	205	14
6.0 (Physiological maturity)	35%	100%		
TOTAL (average)			575	33

Source: Abendroth, L.J., Elmore, R.W., Boyer, M. J., and Marlay, S. K. 2011. Corn Growth and Development. PMR 1009. Iowa State University Extension, Ames, Iowa

EXTENSION

2016 New Products

Table 1. Foliar products for disease control that were updated in the 2016 Guide for Weed, Disease, and Insect Management in Nebraska.

Trade Name	Active Ingredient(s)	Fungicide Class	Change(s) Made
Absolute Maxx	tebuconazole (22.63%) + trifloxystrobin (22.63%)	Mixed Modes of Action	Added to the Corn table
Fortix	fluoxastrobin (14.8%) + flutriafol (19.3%)	Mixed Modes of Action	Added to Wheat table
Propulse	fluopyram (17.4%) + prothioconazole (17.4%)	Mixed Modes of Action	Added to Dry ben and Sugarbeet tables
Prosaro	prothioconazole (19.0%) + tebuconazole (19.0%)	DMI Triazoles Group 3	Added to the Corn table
Quilt	azoxystrobin (7.0%) + propiconazole (11.7%)	Mixed Modes of Action	In Soybean can be applied up to R6 (full seed)
Topguard	flutriafol (11.8%)	DMI Triazoles Group 3	Added to Sorghum and Wheat tables

Table 2: Seed treatment products for disease control that were updated in the 2016 Guide for Weed, Disease, and Insect Management in Nebraska			
Trade Name	Active Ingredient(s)	Fungicide Class	Change(s) Made
Cruiser Maxx Vibrance	thiamethoxam (20.8%) + mefenoxam (3.13%) + fludioxonil (1.04%) + sedaxane (1.04%)	Mixed Modes of Action	Added to Soybean table
ILeVO	fluopyram (48.4%)	SDHI Carboxamides	Added to Soybean table
Inovate Pro	clothianidin (24.03%) + ipconazole (1.203%) + metalaxyl (0.965%)	Mixed Modes of Action	Added to Soybean table
Intego Suite Soybeans	clothianidin (20.0%) + ethaboxam (2.97%) + ipconazole (0.99%) + metalaxyl (0.79%)	Mixed Modes of Action	Added to Soybean table
Mertect 340-F	thiabendazole (42.3%)	MBC Benzimidazoles Group 1	Added to Wheat table
Rancona Crest	ipconazole (0.421%) + metalaxyl (0.562%) + imidacloprid (14.100%)	Mixed Modes of Action	Added to Wheat table
Rancona Pinnacle	ipconazole (0.434%) + metalaxyl (0.579%)	Mixed Modes of Action	Added to Wheat table
Rancona V 100 Pro FS	carboxin (35.52%) + ipconazole (2.22%)	Mixed Modes of Action	Added to Wheat table
Rancona V RTU FS	carboxin (12.58%) + metalaxyl (1.26%) + ipconazole (0.47%)	Mixed Modes of Action	Added to Wheat table

2016 New Products

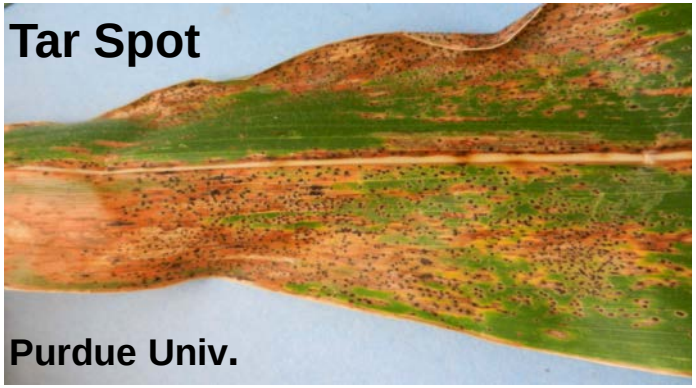
Table 3. Seed treatment nematicide product that was updated in the 2016 Guide for Weed, Disease, and Insect Management in Nebraska.		
Trade Name	**Active Ingredient(s)**	**Change(s) Made**
Clariva pn	Pasteuria nishizawae – Pn1 (15%)	Sugarbeet was added as a labeled registered Nebraska crop

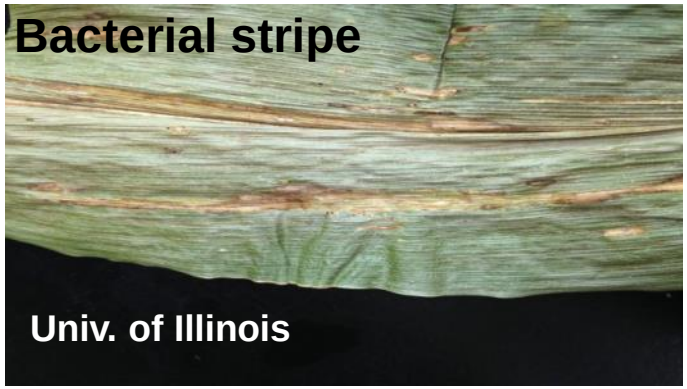
Biological Products for Crop Disease Management

Active Ingredients (concentration)	Registered Crops	Applications & Rate	Comments
Actinovate AG **+Streptomyces lydicus WYEC 108**	Corn, dry bean, dry peas, root/tuber, tomatoes	Soil drench, in-furrow, in irrigation, seed treatment or as foliar spray. 1-12 fl oz/acre depending on crop	Biofungicide against many soil-borne diseases and some foliar pathogens
Afla-Guard GR **Aspergillus flavus (0.0094%)**	Corn, field corn, popcorn	Ground and aerial applications. Apply 10-20 lb/acre	Biofungicide - competes to reduce aflatoxin contamination
Clariva pn **Pasteuria nishizawae - Pn1 (15.0%)**	Soybean, sugarbeets	Seed Treatment 0.9-33.8 fl oz/100 lbs seed	Nematicide
Integral **Bacillus subtilis MBI600 (0.18%)**	Soybean	Applied in-Furrow, soil/growing media, pre-plant/commercial seed	Liquid biological fungicide Alternate brand name is Subtilex®L
Poncho/VOTiVO **Bacillus firmus I-1582 (8.10%)** **+Clothianidin (40.3%)**	Corn (field, popcorn, sweet), soghum, soybean, sugarbeet	Seed treatment Commercially applied	Soybean Cyst Nematode
Regalia Rx **Reynoutria spp. extract**	Corn, soybean	Tank-mixed with leading fungicides 10.5 oz/acres.	Biofungicide - induced systemic resistance against some fungi and bacteria. Promotes plant growth
SabrEx **Trichoderma sp. (3.5% w/w)**	Corn, wheat, sorghum, rye, and oats	Seed treatment. Rates may vary, see label	Induced resistance against diseases. Enhanced nutrient use
Serenade Opti **Bacillus subtilis QST 713 (26.2%)** **+Other ingredients (73.8%)**	Soybean, dry beans, Potatoes	Foliar spray or soil drench Rates may vary, see label	White mold, gray mold, bacterial leafspot, etc.
Xanthion **Bacillus subtilis MBI600 (9.9%)**	Corn (field and sweet)	In-Furrow treatment at a rate of 0.6 to 1.2 oz per acre	Biological fungicide to be used with chemistry

NEW CORN DISEASES REPORTED IN EASTERN CORN BELT

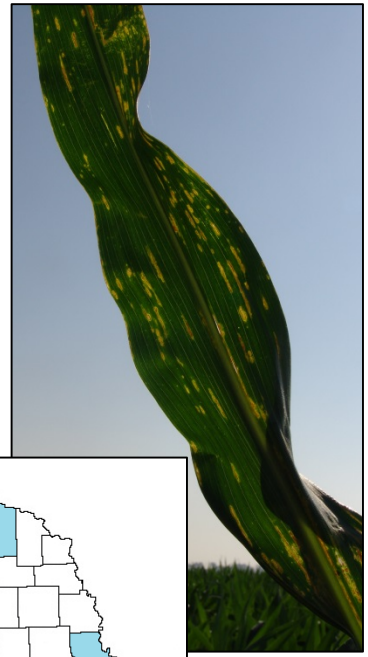
- Fungus
  - Tar Spot - *Phyllachora maydis* and/or *Coniothyrium phyllachorae*
  - Reported in Indiana and Illinois
- Bacteria
  - Bacterial Stripe - *Burkholderia andropogonis*
  - Reported in Illinois in 2015
  - Historically reported in Nebraska decades ago

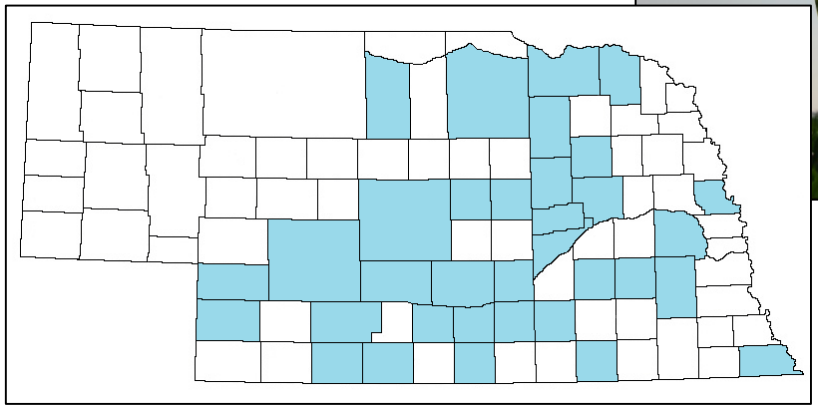




New Bacterial Disease of Corn

- Symptoms
  - Narrow interveinal stripes start on lower leaves
  - Progress higher on plant with favorable conditions
  - Lesions expand and can appear similar to Gray Leaf Spot
  - But, develops earlier than GLS
- Distribution
  - 41 Nebraska counties
  - 1 Kansas, 1 Colorado



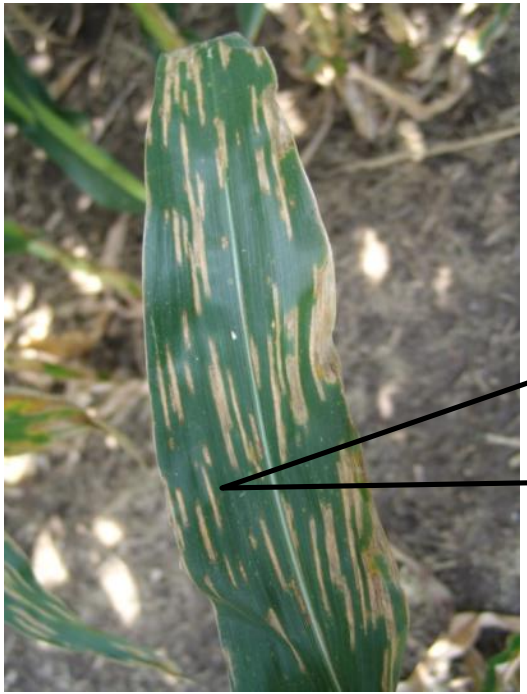


New Bacterial Disease of Corn

- Identification
  - *Xanthomonas* sp.
  - Working with labs in NE, CO, IA and USDA-APHIS and NE Dept. of Ag for species confirmation
- Next steps
  - Monitor for atypical symptoms
  - Report and submit samples for diagnosis and documentation
  - Document and report differences in symptoms, hybrids, fields, etc.

GRAY LEAF SPOT VS. XANTHOMONAS SP.?

Look closely at lesion margins to help differentiate…



Gray Leaf Spot

straight margins

wavy margins

***Xanthomonas* sp.**

EXTENSION

UNL Corn Disease Resources

- Crop Watch - http://cropwatch.unl.edu/
  - Newsletter, efficacy trial data, and publications
- Market Journal – weekly episode or see videos at: http://marketjournal.unl.edu/corndiseases
- Videos – YouTube – UNL Cropwatch channel
  - short Corn Disease videos
- Tamra Jackson-Ziems on Twitter - @tjcksn
- Contact local county Extension office

EXTENSION

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