

PHOSPHITE: Will Soil Applications be as Effective as Foliar?

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**What is the history
of Phosphite?**

A wide range of phosphorus (P) containing compounds were tested in the 1930's as plant fertilizers, at which time it was determined that phosphite was a poor source of nutritional phosphorus.

In the 1970's, interest was renewed in phosphites when it was determined they were very effective against plant diseases such as phytophthora and pythium.

Bayer Cropscience pioneered this research area and patented Aliette and Fosetyl-Al. Following expiration of the patents, the market has exploded with new phosphite products.

While most fungicides act either as contact or xylem translocated compounds, phosphite fungicides and fertilizers move in both the xylem and phloem so that the phosphite ions can move from leaf tissues through the entire plant.

Currently there are over two dozen products, with just over half being registered as a fungicide and the rest as fertilizers or growth aids.

Fungicides vs. Fertilizers

- **Aliette**
- **Agrifos**
- **Fosphite**
- **Lexx-a-phos**
- **Phostrol**
- **ProPhyt**
- **Rampart**
- **Ele-Max**
- **Fitolin-Agro**
- **Nutramix**
- **Nutri-phite**
- **Phosgard**
- **Prudent 44**
- **TKO Phosphite**

IR-4 Program Funding 2007

Evaluation and Incorporation of a Silicon Biofungicide on Horticultural Crops



Bio-pesticides tested:
Sil-Matrix
Phosphite
Kaligreen

IR-4 Project: Inorganic Biopesticides

- **Sil-Matrix®:**
 - Soluble potassium silicate.
- **Fosphite®:**
 - Mono- and di-potassium salts of phosphorous acid.
- **Kaligreen®:**
 - Potassium bicarbonate.

Kiowa

Treatment	Scab Rating	
Control	7.2 a	8.6 a
Sil-Matrix	4.6 bc	6.8 a
Fosphite	1.6 e	2.0 cd
Kaligreen	6.6 ab	8.3 a
Abound + Enable	0.9 e	0.9 d
Sil-Matrix + Abound	3.8 cd	4.6 b
Fosphite + Abound	1.7 de	1.8 cd
Kaligreen + Abound	2.9 cde	3.4 bc

Schley

Treatment	Scab Rating	
Control	7.0 ab	8.9 a
Sil-Matrix	8.1 a	9.1 a
Fosphite	1.5 cd	2.5 bc
Kaligreen	5.5 b	7.2 a
Abound + Enable	0.1 d	0.3 c
Sil-Matrix + Abound	2.2 cd	3.3 b
Fosphite + Abound	0.8 cd	2.2 bc
Kaligreen + Abound	2.4 c	2.9 b



Check – No Fungicide

Fosphite & Abound



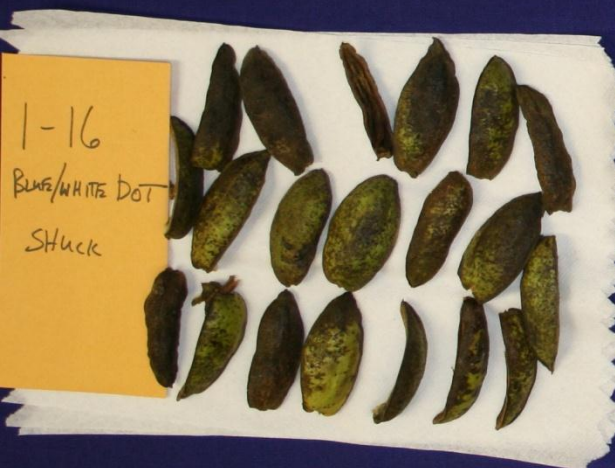
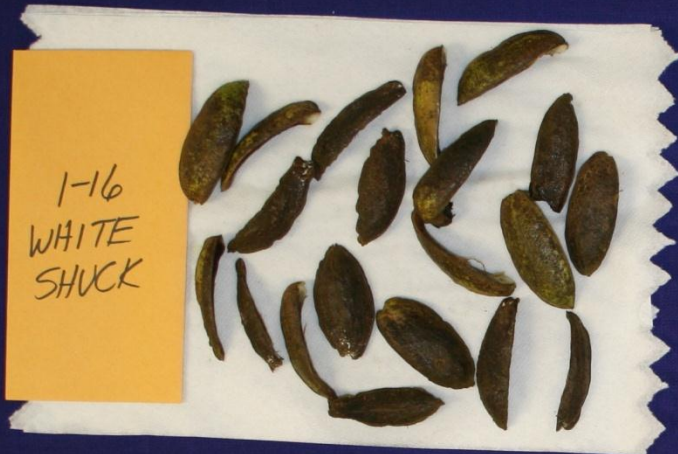
Only Fosphite

Abound & Enable



No Fungicide

Abound & Enable



Sil-Matrix

Fosphite

Kaligreen

What are some of the other phosphite products which may influence scab infection of pecans?



**USDA Specialty Crops
Research Initiative
(SCRI)**

SCRI

Provides funding for solving critical problems for specialty crops through research and extension activities.

Evaluation and Comparison of Phosphorous Acid Biofungicides And Fertilizer on Control of Pecan Scab



The *objectives* of this research are:

- a) to compare the efficacy of foliar applications of Fosphite®, Rampart®, Phostrol® and Nutri-phite® on pecan scab to a commonly used conventional fungicide, Enable®,**
- b) to determine if soil applications of Fosphite®, Rampart®, Phostrol® and Nutri-phite® provide any protection against pecan scab infection.**

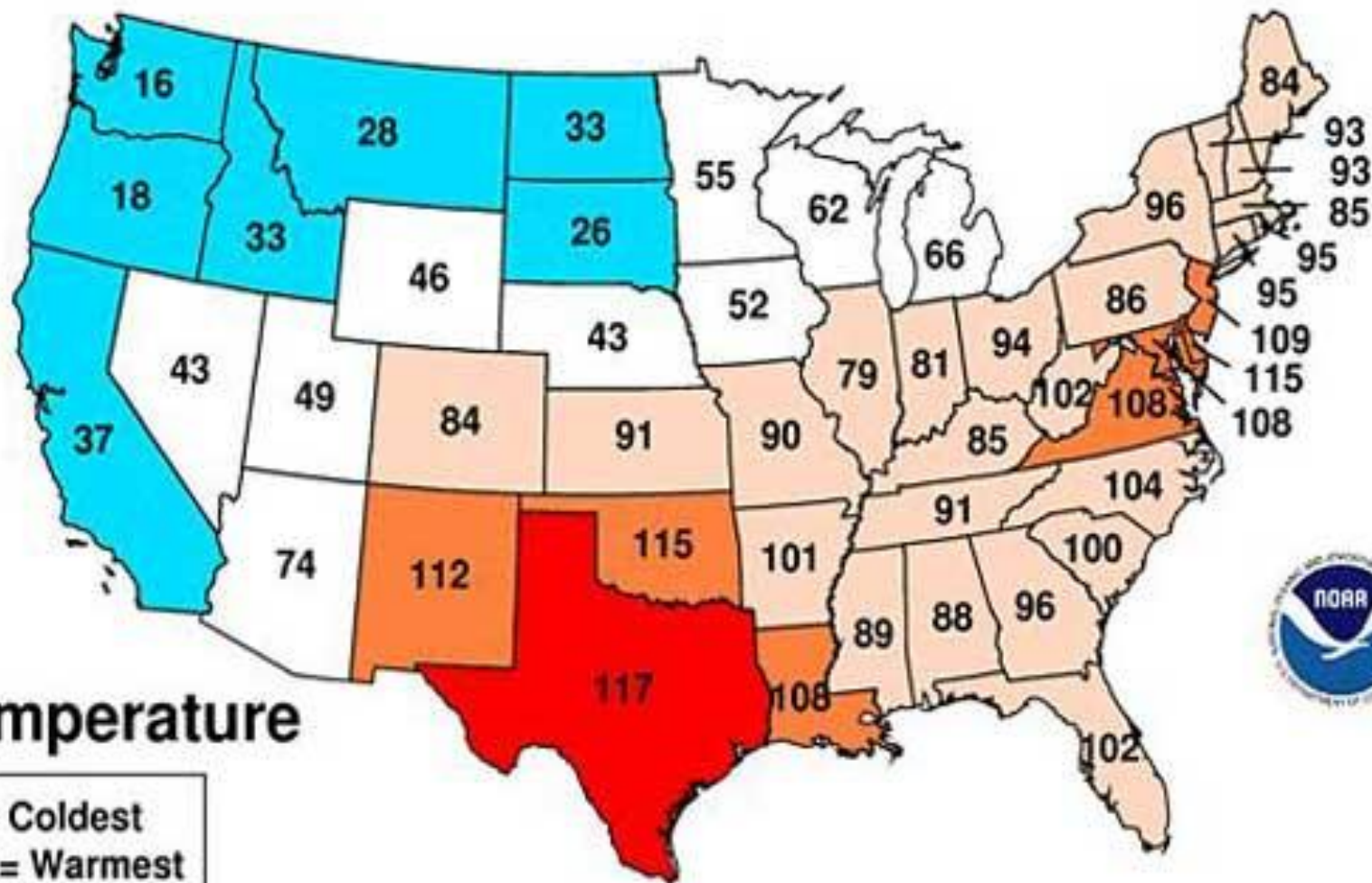






January-August 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



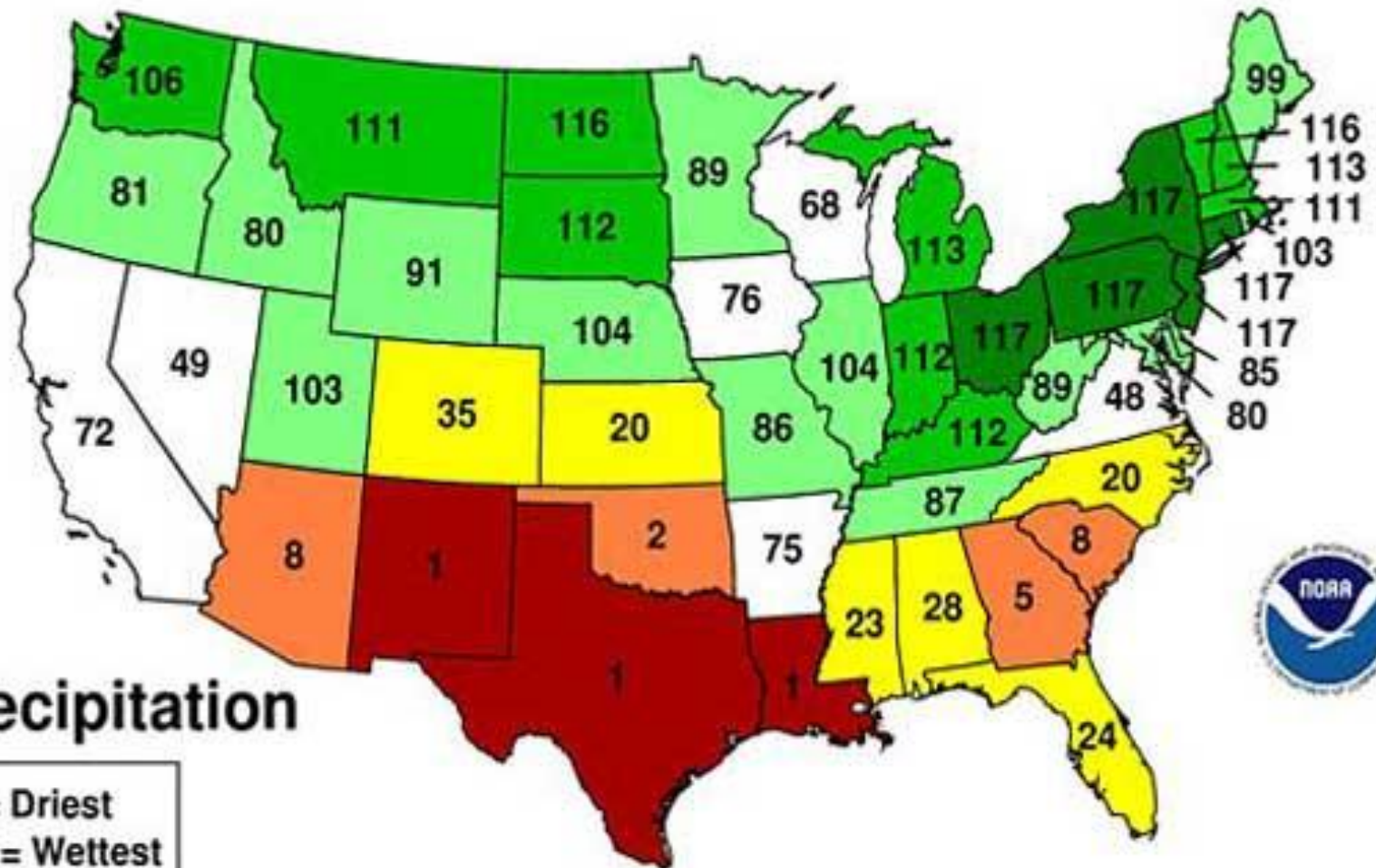
Temperature

1 = Coldest
117 = Warmest



January-August 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



Precipitation

1 = Driest
117 = Wettest



What happened in 2011?

- Little to no leaf scab or other foliar diseases
- Nut scab did not show up until late summer in South Louisiana.



Pecan Scab



1 Hunter-Roberts rating scale.

1 = no scab;

2 2 = trace to 10% infection;

3 3 = 11% to 25% infection;

4 4 = 26% to 50% infection;

5 5 = 51% to 100% infection.

The Pecan Quarterly 12(3):3-6.

5

Candy – Foliar Application

Treatment	Scab Rating	
Control	2.6 a	3.3 a
Fosphite	2.2 b	1.8 bc
Nutri-phite	1.6 c	1.9 b
Phostrol	1.5 c	2.0 b
Rampart	1.8 bc	2.0 c
Enable + Abound	2.0 bc	1.5 b

Candy – Ground Application

Treatment	Scab Rating	
Control	2.2 a	2.4 a
Fosphite	1.8 a	3.1 a
Nutri-phite	2.2 a	1.9 a
Phostrol	2.1 a	2.2 a
Rampart	2.0 a	2.0 a
Enable + Abound	1.6 a	1.5 a

Desirable – Foliar Application

Treatment	Scab Rating	
Control	1.0 a	1.5 a
Fosphite	1.0 a	1.2 b
Nutri-phite	1.0 a	1.4 ab
Phostrol	1.0 a	1.4 ab
Rampart	1.0 a	1.4 ab
Enable + Abound	1.0 a	1.3 a

Desirable – Ground Application

Treatment	Scab Rating	
Control	1.1 a	1.5 a
Fosphite	1.0 a	1.4 a
Nutri-phite	1.0 a	1.4 a
Phostrol	1.0 a	1.4 a
Rampart	1.0 a	1.2 a
Enable + Abound	1.0 a	1.1 a

A large pile of pecan nuts, some whole and some broken, is shown against a blue background. The nuts are light brown with characteristic ridges. A white rectangular label with the name 'Elliott' is positioned in the upper left area.

Elliott

Summary

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- **Phosphite fungicides have provided good control of pecan scab in previous tests, but phosphite fertilizers still need to be evaluated to determine if they will also provide some protection against pecan scab.**

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- **Phosphite fungicides have provided good control of pecan scab in previous tests, but phosphite fertilizers still need to be evaluated to determine if they will also provide some protection against pecan scab.**
- **Drought conditions resulted in very little scab pressure, so currently it is difficult to determine if the soil applications will be as effective as foliar applications.**

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