Thanks Bob Ehn, CAGORAB, and BASF

**FIFRA Sec. 24(c)**
**Special Local Need Label**

For distribution and use only within the state of California in the counties of Lassen, Modoc, Shasta, and Siskiyou
For use as a delayed preemergence treatment in dry bulb onion for kochia control
EPA Reg. No. 241-418
EPA SLN No. CA-150008

This label expires and must not be distributed or used in accordance with this SLN registration after October 31, 2020.

**Active Ingredient**: pendimethalin: N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine 38.7%
**Other Ingredients**: 61.3%
**Total**: 100.0%

1 gallon contains 3.8 pounds of pendimethalin formulated as an aqueous capsule suspension.
White Rot Management Study

• Continued testing of the two-prong approach of using a sclerotial germination stimulants the year before planting onions to trick white rot sclerotia to germinate without a host and fungicides at the time of onion planting to suppress any remaining white rot

• The primary focus in 2015 was testing high rates of garlic juice (5-20 gal/A) compared to DADS
Life after DADS

• DADS (diallyl disulfide) is no longer commercially available in the marketplace

• We need to find cost-effective alternatives for DADs such as garlic and onion by-products (juice, oil, powder, etc.)

• Unfortunately most by-products have a much low concentration of diallyl disulfide than DADS
Single application of DADS on survival of sclerotia of *S. cepivorum* at Tulelake

- **Nontreated**
- **DADS**

<table>
<thead>
<tr>
<th>Sampling date</th>
<th>Sclerotia/500 g soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr 2010</td>
<td>120</td>
</tr>
<tr>
<td>Sep 2010</td>
<td>120</td>
</tr>
<tr>
<td>Apr 2011</td>
<td>30</td>
</tr>
<tr>
<td>Jul 2011</td>
<td>0</td>
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</table>
Effect of DADS on Survival of Sclerotia of Sclerotium cepivorum

![Graph showing the effect of DADS on survival of Sclerotia of Sclerotium cepivorum. The graph displays the number of sclerotia per 500 cc soil over time from December 7, 2007, to February 15, 2009. The x-axis represents the sample date, and the y-axis represents the number of sclerotia. Three different treatments are shown: 0 gal/A (blue diamonds), 0.5 gal/A (green squares), and 1 gal/A (red triangles). The graph indicates that DADS treatments significantly reduce the survival of sclerotia over time.](image-url)
Efficacy of SGS’s to Reduce Sclerotia in Soil

- Untreated
- DADS
- Garlic oil

Sampling Date:
- Before Application, April 2012
- June, 2012
- October, 2012
- Before Planting, March 2013

Sclerotia per 500g soil
Figure 1. Effect of sclerotia stimulants on numbers of viable sclerotia of *Sclerotium cepivorum*, Kern County

The vertical bars indicate the standard errors of the means.
Figure 2. Effect of sclerotia stimulants on numbers of viable sclerotia of *Sclerotium cepivorum*, San Benito County

The vertical bars indicate the standard errors of the means.
2015 White Rot Management Study

- Sclerotial germination stimulants were applied Spring 2014
  - DADS at 1 gal/A
  - Garlic juice from “The Garlic Company” at 5, 10, and 20 gal/A (Thank you John Duffus)

- Wheat (non-host crop) was grown Summer 2014

- Onions were planted Spring 2015
  - Fungicides were applied “in-furrow” at planting
  - Tebuconazole (Folicur) or Penthiopyrad (Fontelis)
Sclerotial Germination Stimulant Application Method
Seedbed after Germination
Stimulant Application
In-furrow fungicide Application

Packer Wheel
Chain Drag
Spray Nozzle
Seed Tube
In-furrow  

Banded on soil surface
2015 Results
2015 Germination Stimulant Results

• DADS and garlic juice failed to reduce sclerotia populations in the soil compared to the untreated

• The reason DADs did not work is very puzzling. It may be related to soil temperatures or the fact that the field site had quite low sclerotia populations to begin with
2015 Onion Yield Results

• White rot severity was low throughout the Tulelake area in 2015

• Soil temperatures were much higher than normal in spring and early summer which slowed disease development
No differences in mid-season onion vigor and late season leaf dieback
2015 Onion Yield for Fungicides applied at planting in 2015
(averaged across germination stimulant treatments)

- **Fontelis 48 fl oz/A**
- **Fontelis 24 fl oz/A**
- **No Fungicide**
- **Folicur 20.5 fl oz/A**

*Onion Yield (tons per acre)*
Diseased Bulb Severity
White Rot Severity on Bulbs for 2015 Fungicide Treatments (averaged across germination stimulant treatments)

- Fontelis 48 fl oz/A
- Fontelis 24 fl oz/A
- No Fungicide
- Folicur 20.5 fl oz/A

White Rot Severity 0-5 scale (0= low severity)
Future Research

• Jeremiah Dung, Tom Turini, and I were awarded a grant from CA DPR to continue testing the two-prong approach of using germination stimulants and fungicides.

• We will start field testing in Fresno and Tulelake in 2016.

• The major objective is to find an effective alternative for DADS.
Thank You

- California Garlic and Onion Research Advisory Board
- The Garlic Company
- Olam International
- Tulelake Onion Growers
- Industry Supporters
- Mike Davis’s Lab and Jeremiah Dung
- IREC Staff and Interns
For More Information

• Visit IREC website (irec.ucanr.edu)
• Contact Rob Wilson
  – 530-667-5117
  – rgwilson@ucanr.edu