



# Walnut Blight Control Investigations Tehama County 2006

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# 2006 Objectives

- 1) Evaluate alternative materials for walnut blight control (Kocide 3000, Sonata and Manzate) plus variable rates of the bud penetrating material Breakthru.
- 2) Verify if applied copper can be reduced from the 6 lb. rate of Kocide 2000.
- 3) Maintain the over tree sprinkler rainfall simulator.
- 4) Evaluate timing of terminal budbreak (prayer stage) and tagged nuts for blight disease progression.
- 5) Determine efficacy of early season bactericides applied at different stages of bud break and shoot elongation. (Lindow et.al.)

# Tehama County 2006 Test Plot

- Simulated rainfall – overtree sprinklers
- RCB with 10 treatments x 5 replicates
- Individual trees
- Dilute (400 gpa) application by handgun
- Four applications 4/20, 4/28, 5/8 and 5/16
- First application at approx 40% Budbreak (prayer stage)
- Visually rated 400-500 nuts per tree





# Bud Break Evaluation

## Terminal Bud Break

| <u>Date</u> | <u>% Bud Break</u> |
|-------------|--------------------|
| 4/8/06      | 5.0%               |
| 4/13/06     | 25.9%              |
| 4/18/06     | <b>33.5%</b>       |
| 4/25/06     | 59.3%              |
| 4/28/06     | <b>72.8%</b>       |
| 5/5/06      | 73.2% (full bloom) |
| 5/12/06     | 77.5%              |

Figure 7. Bud break evaluations for Chandler walnuts in 2006. Cone Grove location.



## Rainfall: natural and simulated for the Tehama Blight Plot:

| <u>Date</u> | <u>Amount (in)</u> | <u>Condition</u>       |
|-------------|--------------------|------------------------|
| 4/2 – 4/5   | 1.13               | natural <sup>1</sup>   |
| 4/7 – 4/12  | 2.09               | natural                |
| 4/15 – 4/16 | .80                | natural                |
| 4/22        | .17                | natural                |
| 4/29        | .72 (10 hours)     | simulated <sup>2</sup> |
| 5/10        | .72 (10 hours)     | simulated              |
| 5/17        | .72 (10 hours)     | simulated              |
| 5/19        | .25                | natural                |
| 5/21 – 5/23 | .38                | natural                |
| 5/26        | .01                | natural                |

<sup>1</sup>Natural rainfall – 7 events for 4.83 inches

<sup>2</sup>Simulated rainfall – 3 events for 2.16 inches

Figure 4. Natural and simulated rainfall for the Tehama material evaluation experiment.



| DATE            | 5/10 | 5/15  | 5/19  | 5/22  | 5/25  | 5/30  | 6/2   | 6/5   | 6/8   | 6/12  | 6/15  | 6/19  |
|-----------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| % BLIGHTED NUTS | 0.0% | 12.9% | 31.7% | 48.3% | 53.1% | 60.4% | 65.2% | 69.8% | 72.5% | 73.5% | 73.9% | 74.2% |

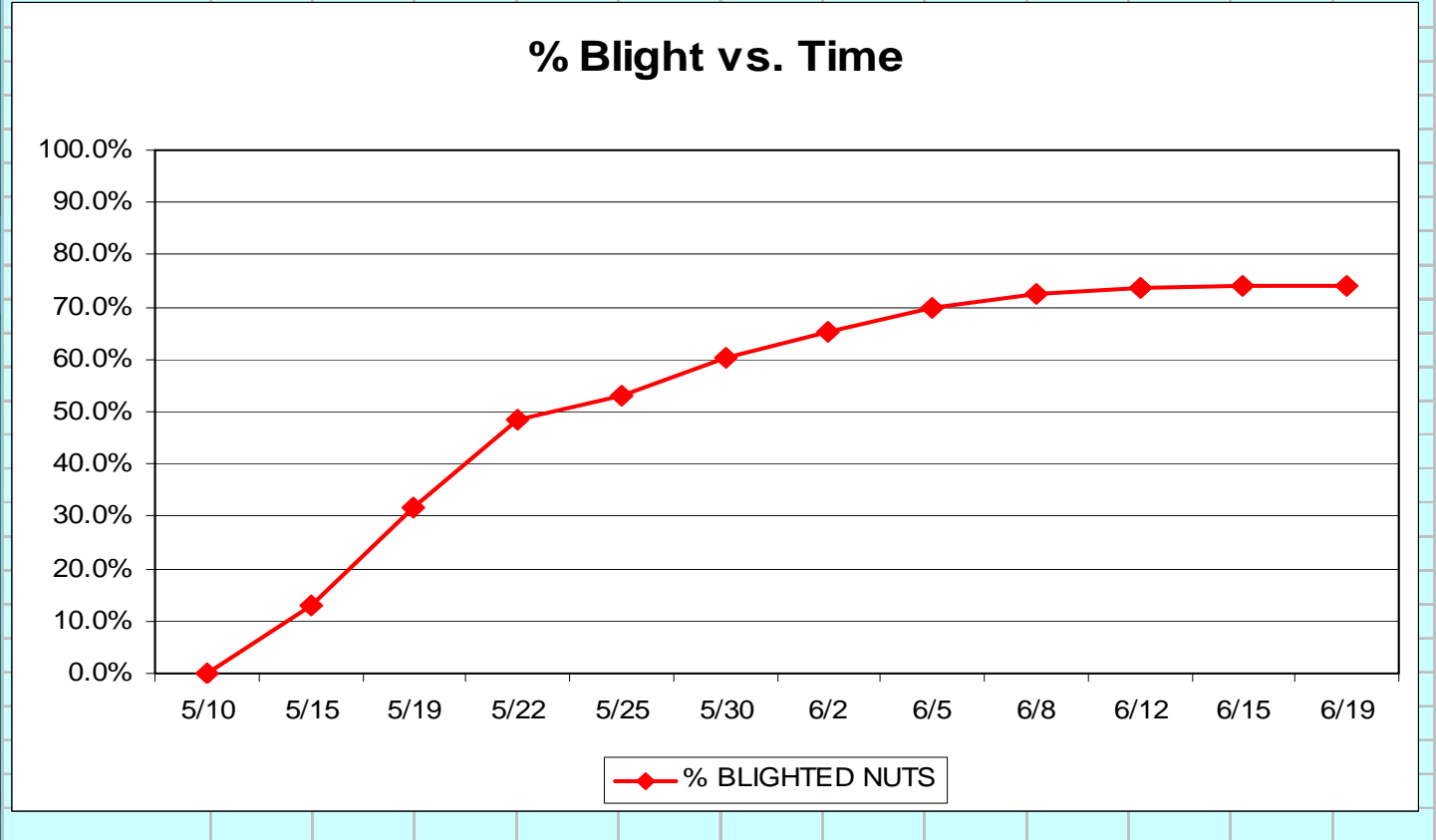


Figure 8. Blight symptoms on walnuts under simulated plus natural rainfall.

## Treatments for the material evaluation plot:

| <u>Treatment</u>                             | <u>Rate</u>           |
|--|-----------------------|
| 1. Kocide 2000 <sup>1</sup>                  | 6 lbs./Ac.            |
| 2. Kocide 2000 + Manex                       | 6 lbs. + 58 oz./Ac.   |
| 3. Kocide 2000 + Manex                       | 4 lbs. + 58 oz./Ac.   |
| 4. Kocide 3000 <sup>2</sup> (GX 569) + Manex | 4.6 lbs. + 58 oz./Ac. |
| 5. Kocide 3000 (GX 569) + Manex              | 3.5 lbs. + 58 oz./Ac. |
| 6. Kocide 2000 + Manzate 75DF <sup>3</sup>   | 6 lbs. + 2.4 lbs./Ac. |
| 7. Sonata <sup>4</sup>                       | 4 qts./Ac.            |
| 8. Sonata                                    | 6 qts./Ac.            |
| 9. Sonata + Kocide 2000                      | 6 qts. + 6 lbs./Ac.   |
| 10. Control (simulated & natural rainfall)   | —                     |
| 11. Control (natural rainfall)               | —                     |

<sup>1</sup>Kocide 2000: Dupont Crop Protection, 35% metallic copper

<sup>2</sup>Kocide 3000: Dupont Crop Protection, 30% metallic copper

<sup>3</sup>Manzate 75DF: Dupont Crop Protection, zinc ion and manganese ethylene-bisdithiocarbamate

<sup>4</sup>Sonata: AgraQuest, bacillus pumulis strain QST 2808

Figure 1. Spray materials and rates for the Tehama walnut blight plot. Spray applications were made on 4/20, 4/28, 5/8 and 5/16. 33.5% terminal bud break occurred on 4/18 with full bloom on 5/15/06.

## Material Evaluation

| Treatment                                    | % Blight             | Phytotoxicity |
|--|----------------------|---------------|
| 7. Sonata @ 4 qts.                           | 60.26 a <sup>1</sup> | 0             |
| 10. Control (simulated and natural rainfall) | 59.27 a              | 0             |
| 9. Sonata @ 6 qts. + Kocide @ 6 lbs.         | 51.39 ab             | 0             |
| 8. Sonata @ 6 qts.                           | 51.22 ab             | 0             |
| 1. Kocide @ 6 lbs.                           | 39.75 abc            | 0             |
| 3. Kocide @ 4 lbs. + Manex <sup>2</sup>      | 30.61 bcd            | 0             |
| 5. Kocide 3000 @ 3.5 lbs. + Manex            | 28.85 bcd            | 0             |
| 6. Kocide @ 6 lbs. + Manzate @ 2.4 bls.      | 19.49 cd             | 0             |
| 4. Kocide 3000 @ 4.6 lbs. + Manex            | 14.54 d              | 0             |
| 2. Kocide @ 6 lbs. + Manex                   | 12.42 d              | 0             |
| 11. Control (natural rainfall) <sup>3</sup>  | 12.50                | 0             |

<sup>1</sup>Duncan's multiple range test for treatment means at the 5% level.

<sup>2</sup>Manex @ 58 oz./Ac.

<sup>3</sup>Non replicated control outside simulated rainfall.

Figure 5. Blight ratings and phytotoxicity for the test treatments and rates.

# In Summary

- Simulated rainfall increased disease pressure
- The addition of Manex improves disease control
- Under severe disease pressure need 6 lbs. KOC 2000
- Kocide 3000 @ 4.6 lbs. performed well
- Manzate 75DF worked well
- Bacillus pumulis is not a control option at this time

# How to Kill Blight

- 1) First application at 40% prayer stage  
Second 7-10 days later
- 2) Watch weather and treat accordingly  
4-6 lbs. Kocide 2000 – 35% metallic  
3.5-4.6 lbs. Kocide 3000 – 30% metallic  
58 oz. Manex  
8 oz. silicon
- 3) Full coverage for the first and second  
Watch weather and treat accordingly