TetraCURB™ MAX

Botanical Contact Miticide-Insecticide

IR-4 Workshop 2021

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KEMIN® CROP TECHNOLOGIES

New FIFRA 25(b) Exempt Miticide-Insecticide

TetraCURB™ MAX

Active Ingredients

- Castor oil, 20%
- Rosemary oil, 10%
- Clove oil, 3%
- Peppermint oil, 2%

Target Pests

- Mites, spider mites
- Small, soft-bodied insects such as: aphids, whiteflies, thrips, mealybugs, lygus

Application

- Contact
- Foliar
- Standard spray equipment, high volume sprayers, booms, hydraulic-air assist

Application Sites

- All crops
- Indoors and outdoors

Multiple Modes of Action

TetraCURB™ MAX

NEUROTOXIC EFFECT

PARALYSIS

The botanical oil active compounds affect the octopamine receptors specific to insects, disrupting its nervous system, causing paralysis followed by its death

CONTACT EFFECT

SUFFOCATION

The castor oil provides true pest suffocation by blocking air from entering the spiracle, leading to the pest death

DESICCATION

The formula degrades/disrupts the waxy cuticle allowing the active ingredients to quickly penetrate and induce water loss in mites, resulting in desiccation and death

REPELLENT EFFECT

REPELLENCY

The vapor exposure to the botanical oils interferes with the pest's sensing faculties, inducing hyperactivity and avoidance behavior thus keeping them away and limiting chances of their establishment on crops.

✓ **Quick knockdown**

✓ **Slow the chance of pest resistance development**

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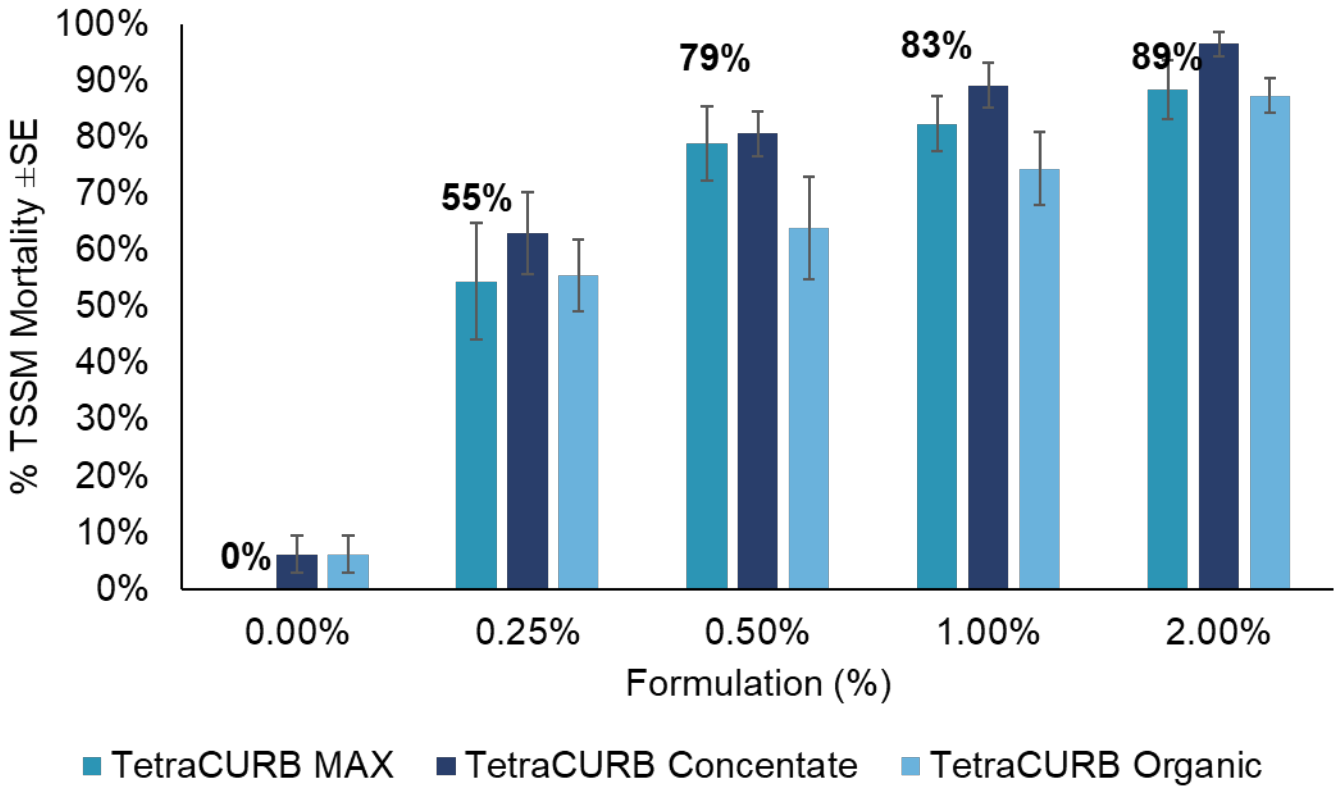
TSSM Bioassay



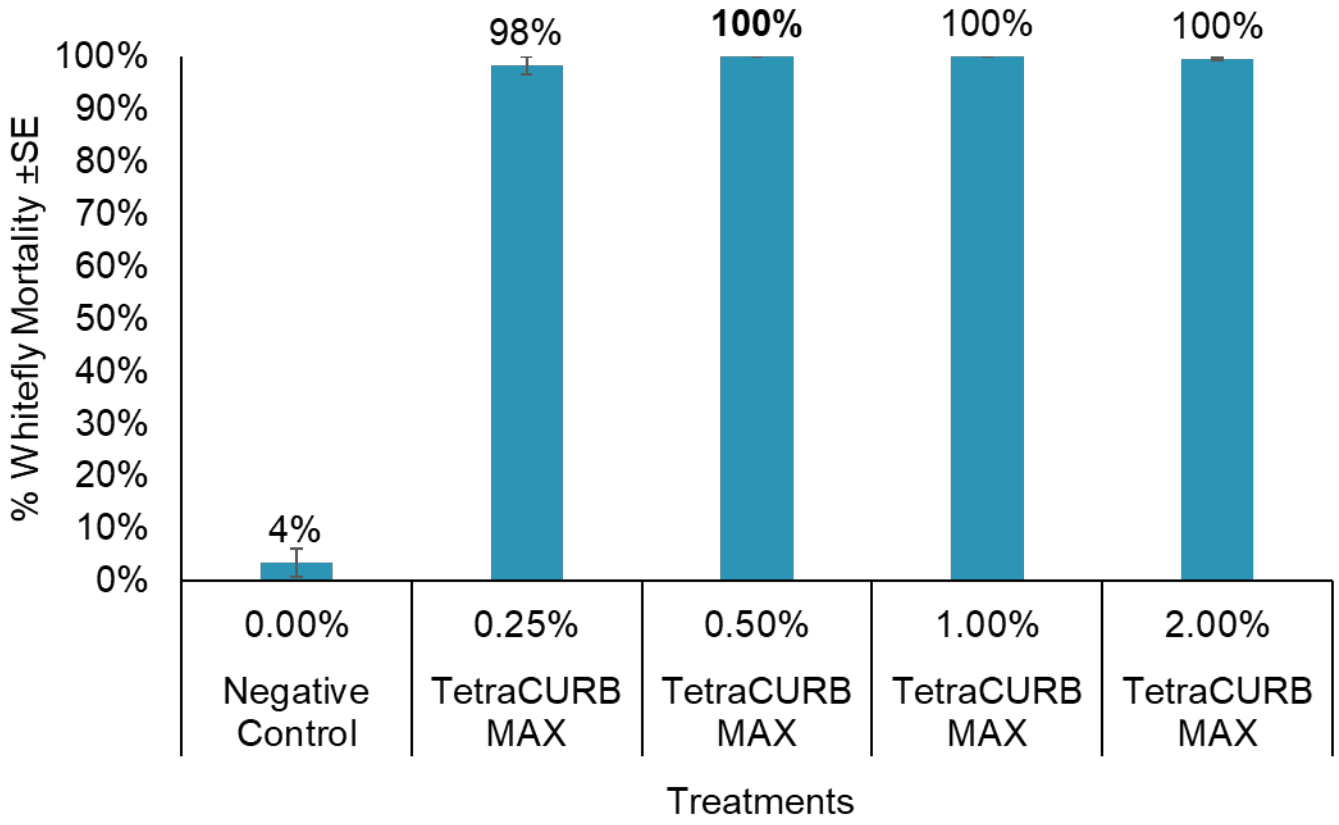
- Efficacy against adult *Tetranychus urticae* Koch (two-spotted spider mite, TSSM)
- N = 6, 10 mites/leaf x 6 replicates

RESULTS:

- TetraCURB MAX compared similarly to TetraCURB Concentrate & TetraCURB Organic at all rates
  - The standard error bars overlap indicating no significance
- TetraCURB MAX ranged from 79-83% efficacy between 0.5-1.0% application rates

Silverleaf Whitefly Bioassay

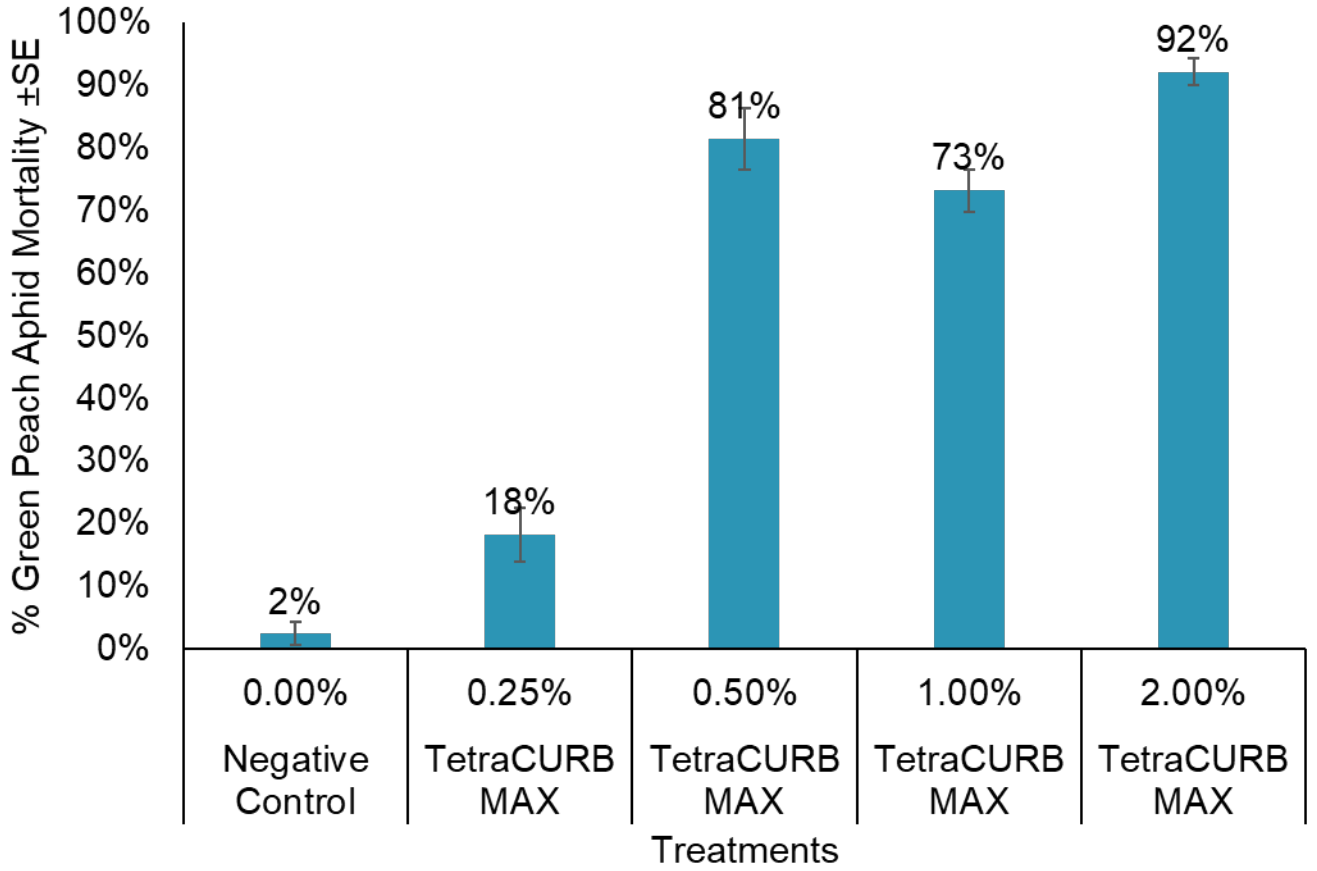
- Efficacy of TetraCURB MAX against adult *Bemisia tabaci* (silverleaf whitefly)
- Formulations were diluted to 0.25, 0.5, 1.0, and 2.0% in water.
  - Negative control (no spray - 0%)
- Green bean leaves were cut with ~10-40 whitefly/leaf
  - N = 6 leaves/treatment
- Evaluation 24 hr after application



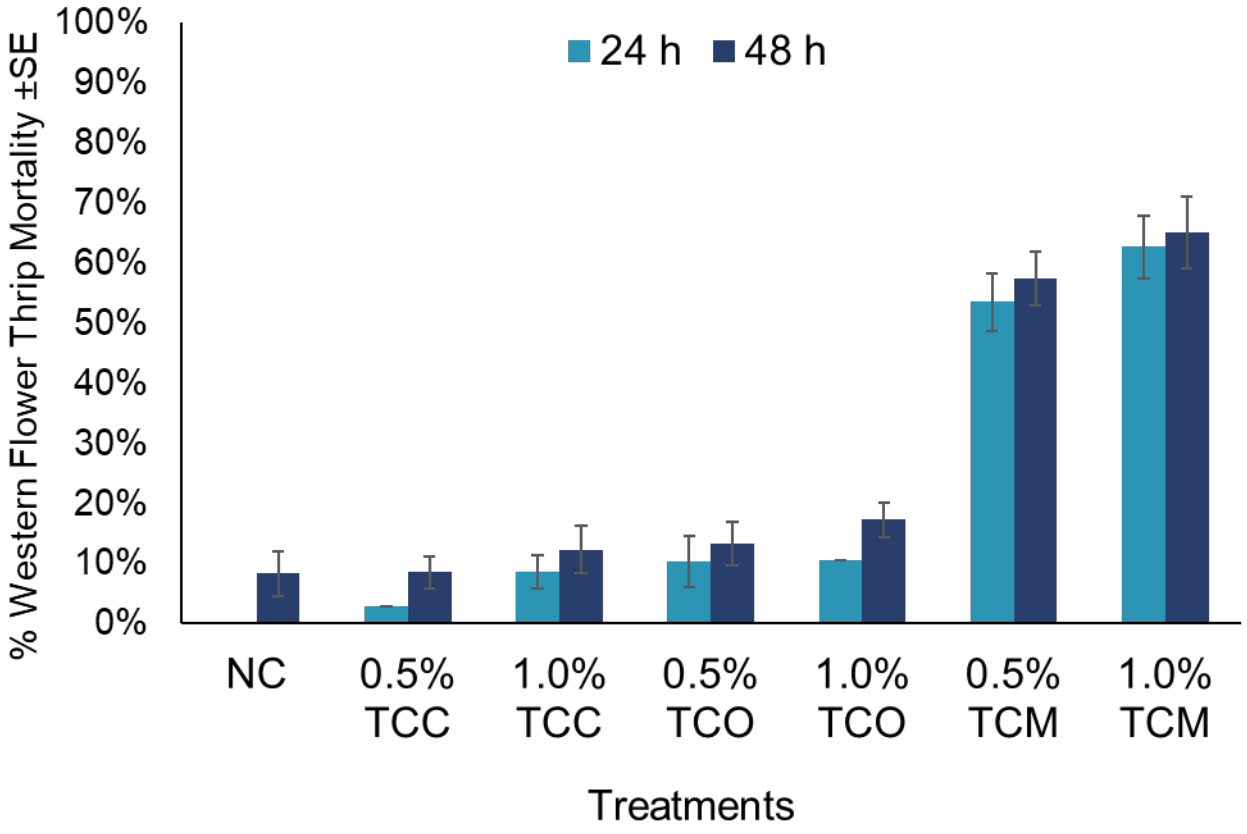
TCC = 100%, TCO = 90% (@ 0.5% rate)

Green Peach Aphid Bioassay

- Efficacy of TetraCURB MAX against adult *Myzus persicae* Sulzer (green peach aphid)
- Formulations were diluted to in water
  - Negative control (no spray - 0%)
  - Positive Controls
    - TetraCURB Concentrate
    - TetraCURB Organic
- Leaf cut outs from soybean plants were taken with 20-40 adult aphids
  - N = 6 leaves/treatment
- Evaluation 24 hr after application



Western Flower Thrip (WFT) Bioassay



- Efficacy of TetraCURB MAX on 2nd instar *Frankliniella occidentalis* (western flower thrip, WFT)
- Formulations were diluted to in water
  - Negative control (no spray - 0%)
  - Positive Controls
    - TetraCURB Concentrate
    - TetraCURB Organic
- Leaf cut outs from soybean plants were loaded with 10 2nd instar larvae
  - 3x N = 6 leaves/treatment
- Evaluation 24 hr & 48 hr after application

Application & Testing Needs

TetraCURB™ MAX

Application Information:

- Apply when pest population first appears and before economic threshold is reached
- Complete coverage of the leaf and plant surfaces, apply to run off
- Make 2-3 consecutive applications 5-7 days apart
- Rates:
  - 64 fl oz/100 gal (moderate infestation)
  - 128 fl oz/100 gal (high infestation)
- Apply early in the morning or late afternoon when temperature is under 90 °F

Testing Needs:

- Greenhouse and field **efficacy trials** on all small, soft-bodied insects and mites
- Plant **safety trials** at 256 fl oz/100 gal (highest label rate), 2x, and 4x