MCW-2 (FLUENSULFONE) FOR MANAGEMENT OF ROOT-KNOT NEMATODE ON ANNUAL CROPS IN CALIFORNIA

BECKY B. WESTERDAHL
EXTENSION
NEMATOLOGIST /
PROFESSOR OF NEMATOLOGY,
UC DAVIS

MBAO
ORLANDO, FL
NOVEMBER 7, 2012

www: nematology.ucdavis.edu
WHAT NEMATICIDES ARE AVAILABLE IN CALIFORNIA?

No longer available or in danger of going away soon  Non-fumigants

<table>
<thead>
<tr>
<th>Nematicide</th>
<th>Year</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARBON DISULFIDE (CS2)</td>
<td>1869</td>
<td>FUMIGANT</td>
</tr>
<tr>
<td>*CHLOROPICRIN</td>
<td>1936</td>
<td>FUMIGANT</td>
</tr>
<tr>
<td>METHYL BROMIDE</td>
<td>1940'S</td>
<td>FUMIGANT</td>
</tr>
<tr>
<td>EDB (ETHYLENE DIBROMIDE)</td>
<td>&quot;</td>
<td>FUMIGANT</td>
</tr>
<tr>
<td>DD (1,3-D+1,2-D) (1,2-DICHLOROPROPANE)</td>
<td>&quot;</td>
<td>FUMIGANT</td>
</tr>
<tr>
<td>DBCP (DIBROMOCHLOROPROPANE)</td>
<td>&quot;</td>
<td>FUMIGANT</td>
</tr>
<tr>
<td>*TELONE II (1,3-D) (1,3-DICHLOROPROPENE)</td>
<td>&quot;</td>
<td>FUMIGANT</td>
</tr>
<tr>
<td>FORMALDEHYDE</td>
<td>1950'S</td>
<td>FUMIGANT</td>
</tr>
<tr>
<td>*MIT&gt;&gt;METAM-SODIUM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*BASAMID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEMACUR (FENAMIPHOS)</td>
<td>LATE</td>
<td>OP</td>
</tr>
<tr>
<td>*FURADAN (CARBOFURAN)</td>
<td>50'S &amp;</td>
<td>CARB</td>
</tr>
<tr>
<td>*MOCAP (ETHOPROP)</td>
<td>1960'S</td>
<td>OP</td>
</tr>
<tr>
<td>DASANIT</td>
<td>&quot;</td>
<td>OP</td>
</tr>
<tr>
<td>*TEMIK (ALDICARB)</td>
<td></td>
<td>CARB</td>
</tr>
<tr>
<td>*VYDATE (OXAMYL)</td>
<td>1970'S</td>
<td>CARB (SYSTEMIC)</td>
</tr>
<tr>
<td>*ENZONE (GY-81) SODIUM</td>
<td>1990'S</td>
<td>FUMIGANT</td>
</tr>
<tr>
<td>TETRATHIOCARBONATE&gt;&gt;CS2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*DITERA (MYROTHECIUM VERRUCARIA TOXIN)</td>
<td>&quot;</td>
<td>NATURAL</td>
</tr>
<tr>
<td>*TELONE EC, INLINE</td>
<td></td>
<td>FUMIGANT</td>
</tr>
<tr>
<td>*ADMIRE PRO (IMIDACLOPRID)</td>
<td>2000'S</td>
<td>NEONICITYNOID</td>
</tr>
<tr>
<td>*NEMA-Q (QUILLAJA, SOAPBARK TREE)</td>
<td>&quot;</td>
<td>NATURAL</td>
</tr>
<tr>
<td>*ABAMECTIN SEED TREATMENTS</td>
<td>&quot;</td>
<td>NATURAL</td>
</tr>
<tr>
<td>MIDAS (IODOMETHANE)</td>
<td>&quot;</td>
<td>FUMIGANT</td>
</tr>
<tr>
<td>*MELOCON (PAECILOMYCES LILACINUS)</td>
<td>&quot;</td>
<td>NATURAL</td>
</tr>
<tr>
<td>*MOVENTO</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OP=ORGANOPHOSPHATE,  CARB=CARBAMATE  *Currently available for use on some crops in California
EXPERIMENTAL DESIGN:
UC SOUTHCOST RESEARCH AND EXTENSION CENTER

FIELD WITH A 60 YEAR HISTORY OF ROOT-KNOT NEMATODE INFESTATION

2010 - 5 RATE TRIALS (NEMATICIDES)
2011 - 2 COMBINATION TRIALS (NEMATICIDES, FUNGICIDES, HERBICIDES)

5 REPLICATES - RCB
EACH REP - 1 ROW WIDE
20 FEET LONG (6 METERS)
2010 APPLICATION INFORMATION:

CARROT, TOMATO, CUCUMBER. CANTALOUPE, SQUASH (8 TREATMENTS / TRIAL)

14 DAYS PREPLANT - TELONE II INJECTED (9 GPA, 44.9 L/HA)

7 DAYS PREPLANT - MCW-2 (2,3,4,8 KG/HA) AND METAM (224.4 L/HA) SPRAYED ON SOIL SURFACE, FOLLOWED BY TILLING, FOLLOWED BY SPRINKLER IRRIGATION

AT PLANTING - VYDATE (OXAMYL, 1.12 KG/HA) SPRAYED ON SOIL SURFACE, FOLLOWED BY SPRINKLER IRRIGATION
2010 CARROT TRIAL

NUMBER AND WEIGHT OF CARROTS: TOTAL, MARKETABLE, PERCENT MARKETABLE; JUVENILES IN SOIL AT HARVEST

2010 CARROT TRIAL - ROOT-KNOT NEMATODE / LITER OF SOIL AT HARVEST
2010 TOMATO TRIAL
WEIGHT - TOTAL, RED FRUIT, GREEN FRUIT, PLANT; ROOT GALL RATING (0-10), JUVENILES
2010 CUCUMBER TRIAL
TOTAL WEIGHT, TOTAL NUMBER, AVERAGE SIZE; ROOT GALL RATING (0-10), JUVENILES
2010 CANTALOUPE TRIAL - ROOT-KNOT NEMATODE / LITER OF SOIL AT HARVEST

TOTAL WEIGHT OF FRUIT (KG)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

2 kg MCW-2
3 kg MCW-2
4 kg MCW-2
8 kg MCW-2
Telone II
Metam
Vydate
Untreated

TOTAL WEIGHT, TOTAL NUMBER, AVERAGE SIZE, 9, 12, 15, 18, 23 PER BOX; ROOT GALL, JUVENILES
2010 SQUASH TRIAL

TOTAL WEIGHT, TOTAL NUMBER, AVERAGE SIZE; ROOT GALL RATING (0-10), JUVENILES
2011 APPLICATION INFORMATION:
   TOMATOES (10 TREATMENTS),
   CUCUMBER (12 TREATMENTS)

28 DAYS PREPLANT - TELONE II INJECTION

14 DAYS PREPLANT (TARPED) - MBrcP APPLIED BY TRICAL IN DRIP TUBING
   CHLOROPICRIN APPLIED VIA DRIP IRRIGATION

7 DAYS PREPLANT - MCW-2 AND KPAM

AT PLANTING - VYDATE, QUADRIS, RIDOMIL, PARALLEL

21 DAYS AFTER PLANTING - MOVENTO, SANDEA, SELECT, METRIBUZIN
Key to Abbreviations Used in Graphs

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
<th>Rate/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP</td>
<td>Chloropicrin</td>
<td>168 kg</td>
</tr>
<tr>
<td>Kpam</td>
<td>KPam</td>
<td>224.5 l</td>
</tr>
<tr>
<td>MBrCP</td>
<td>MBrCP</td>
<td>392 kg</td>
</tr>
<tr>
<td>MCW-2</td>
<td>MCW-2</td>
<td>2 &amp; 4 kg</td>
</tr>
<tr>
<td>Metr</td>
<td>Metribuzin</td>
<td>0.56 kg</td>
</tr>
<tr>
<td>Movento</td>
<td>Movento</td>
<td>0.15 l</td>
</tr>
<tr>
<td>Parall</td>
<td>Parallel</td>
<td>0.47 l</td>
</tr>
<tr>
<td>Quad</td>
<td>Quadris</td>
<td>0.45 l</td>
</tr>
<tr>
<td>Rid</td>
<td>Ridomil</td>
<td>0.47 l</td>
</tr>
<tr>
<td>Sand</td>
<td>Sandea</td>
<td>0.07 kg</td>
</tr>
<tr>
<td>Selec</td>
<td>Select</td>
<td>0.23 l</td>
</tr>
<tr>
<td>Telone</td>
<td>Telone II</td>
<td>44.9 l</td>
</tr>
<tr>
<td>Vyd</td>
<td>Vydate</td>
<td>1.12 kg</td>
</tr>
</tbody>
</table>

WEED EVALUATIONS AT 7 WEEKS:
CHERYL WILEN
UC STATEWIDE IPM PROGRAM
2011 TOMATO TRIAL

5 WEEKS - WEIGHT OF PLANT, SHOOT, ROOT; GALL RATING

HARVEST - WEIGHT OF PLANT + FRUIT, RED FRUIT, GREEN FRUIT, PLANT

ROOT GALL RATING (0-10), JUVENILES AT HARVEST

Telone
Hand weeded control
MCW-2 4kg + Vyd + Quad
MCW-2 4kg + Quad + Rid
CP + Kpam + MCW-2 4kg
CP + Kpam + MCW-2 2kg
CP + Kpam + Telone
MBrCP
Rid + Quad + Sand + Metr + Parall
Untreated control.

TOMATO HARVEST - WEIGHT OF RED FRUIT

0.05
0.05
2011 TOMATO TRIAL

TOMATO HARVEST - ROOT GALL RATING (0-10)

- Telone
- Hand weeded control
- MCW-2 4kg + Vyd + Quad
- MCW-2 4kg + Quad + Rid
- CP + Kpam + MCW-2 4kg
- CP + Kpam + MCW-2 2kg
- CP + Kpam + Telone
- MBrCP
- Rid + Quad + Sand + Metr + Parall
- Untreated control.

Rating:
- 0.05
2011 TOMATO TRIAL

WEED EVALUATIONS:
PERCENT - COVER, GRASSES, BROADLEAVES, CONTROL; FOXTAIL, NIGHTSHADE, YELLOW NUTSEDGE, SPRANGLETOP, PIGWEED, PURSLELANE
2011 CUCUMBER TRIAL
5 WEEKS - WEIGHT OF PLANT, SHOOT, ROOT; GALL RATING
HARVEST - TOTAL WEIGHT, TOTAL NUMBER, AVERAGE SIZE
ROOT GALL RATING (0-10), JUVENILES AT HARVEST
5 WEEKS AFTER PLANTING -
ROOT GALL RATING (0-10)

- Telone
- MCW-2 4kg + Movento
- Hand weeded control
- MCW-2 4kg + Rid + Quad + Sand + Selec
- MCW-2 4kg + Vyd + Quad + Rid
- MCW-2 4kg + Quad + Rid
- CP + Kpam + MCW-2 4kg
- CP + Kpam + MCW-2 2kg
- CP + Kpam + Telone
- MBrCP
- Rid + Quad + Sandea + Select
- Untreated control.

2011 CUCUMBER TRIAL

CUCUMBER TRIAL
2011 CUCUMBER TRIAL

WEED EVALUATIONS:
PERCENT - COVER, GRASSES, BROADLEAVES, CONTROL; FOXTAIL, NIGHTSHADE, YELLOW NUTSEDGE, SPRANGLE, GOOSEFOOT, LAMBSQUARTERS, PURSLANE

WEEDS - PERCENT CONTROL
CUCUMBER TRIAL

Telone
MCW-2 4kg + Movento
Hand weeded control
MCW-2 4kg + Rid + Quad + Sand + Selec
MCW-2 4kg + Vyd + Quad + Rid
MCW-2 4kg + Quad + Rid
CP + Kpam + MCW-2 4kg
CP + Kpam + MCW-2 2kg
CP + Kpam + Telone
MBrCP
Rid + Quad + Sandea + Select
Untreated control.