TE-3

a 3-way alternative for methyl bromide

Tom Starkey

TE-3

Ingredients

- Paladin® DMDS
- 1,3-D (Telone II®)
- Chloropicrin
- Final name and amounts are being tweaked

Amount

- Paladin - 44% (w)
- Telone - 33% (w)
- Pic - 23% (w)

PALADIN®

Soil Fumigant

For control or suppression of weeds, soil-borne plant pathogens and nematodes in soils to be planted with vegetables (tomatoes, peppers, eggplants), cucurbit crops (cucumber, squash and melons), strawberries, blueberries, field-grown ornamentals, and forest nursery stock where plastic tarp is used for fumigation. For application via raised bed shank injection and broadcast/flat fume methods only.

ACTIVE INGREDIENT:	
Dimethyl disulfide	98.8%
OTHER INGREDIENTS:	1.2%
TOTAL:	100.0%

Previous Coop Testing

Fumigant	Rate	Components	Plastic	# of studies
Chloropicrin	100 to 300 lbs/a	100% Chloropicrin	HDPE, LDPE, VIF, TIF	7
Pic+®	150 to 300 lbs/a	85% Chloropicrin + 15% Solvent A	HDPE, LDPE, VIF, TIF	7
New Pic +	300 lbs/a	85% Chloropicrin + 15% Solvent B	HDPE	2
DMDS + Chlor	690 to 730 lbs/a	79% DMDS + 21% Chloropicrin	HDPE	6
Chlor 60®	100 to 400 lbs/a	60% Chloropicrin & 40% 1,3-D	HDPE, LDPE, VIF, TIF	7
Midas® 50/50	160 lbs/a	50% Iodomethane + 50% Chloropicrin	VIF	1
Midas ®98/2	100 lbs/a	98% Iodomethane + 2% Chloropicrin	VIF	1

DMDS Area-Wide Key Points

- It smells
- It's a good fumigant
- GA – Glennville & Jesup
  - Seedling Count = > Mbr
  - Root Morphology = Mbr
  - 2nd yr Trichoderma ~= MBr
  - RCD (Glennville) >Mbr
- SC – Trenton & Blenheim
  - Seedlings Count = MBr
  - Root Morphology => MBr
  - Trichoderma >Mbr
  - RCD (Blenheim) > MBr
- AL – Elberta & Camden
  - Seedling Count (Elberta) <MBr; (Camden) = MBr
  - Trichoderma (Camden) > MBr; (Elberta) = MBr

Facts about Paladin (DMDS)

- Manufactured by Arkema
- Paladin® soil fumigant formulations are available for both shank (Paladin®) and drip (Paladin® EC) applications. Received registration from EPA in July 2010
- DMDS has a long history as an industrial chemical and its use as a food additive in the US and in Europe.
- DMDS is produced biogenically in wetlands and oceans, and plays a role in the global sulfur cycle. It is also produced by certain plants, including members of the Allium and Brassica families, where it has been postulated to play a natural defensive role in response to damage. Measurable levels of biogenic DMDS are found in a variety of crops and foods.

TE-3 Research - UGA

- Stanley Culpepper
- Associate Professor and Extension Agronomist – UGA, Tifton

TE-3 Research - UGA

- Testing it for 3 years
  - 2010 – 3 trials
  - 2011 – 8 trials
  - 2012 – 5 trials + 900 acres of grower applied
    - 50% excellent results
    - 40% good
    - 10% unacceptable
- In 2010
  - Co-applied – 78% control of nutsedge
  - Tank mixed – 94% control of nutsedge

Spring applications were better than fall

TE-3 (WSP) research summary

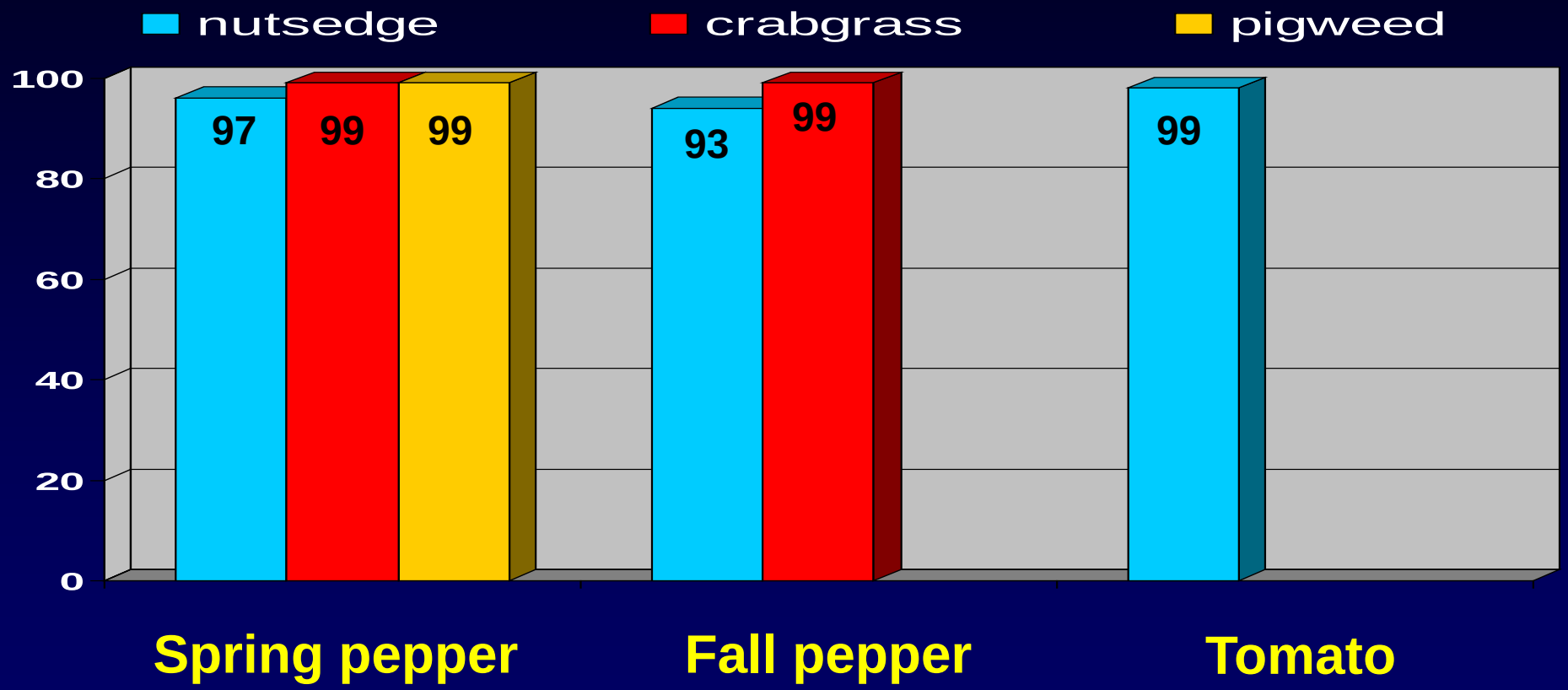
- Use of any alternatives must include additional herbicides.
- WSP tested at 350 lb/a under VIF. Recommended that the rate not be reduced.
- Cost of application was less than methyl bromide 200 lb/a under VIF.
- Due to the DMDS, odor is a concern.
  - On a scale of 1-10, Paladin = 10, this mix = 2-3
- Effective on nutsedge, crabgrass and pigweed.
- Grasses and broadleaves required additional herbicides.

WSP

1. New fumigant system-minimal release in 2012.
2. Mixture of Paladin, chloropicirn, and Telone II.*
3. Trade name in development.
4. Twenty eight acres in 2011 (4 application times)
5. Data in 2010 and 2011 looks very good.

***Patent pending**

Percent weed control by the WSP + Herbicide Program. 2010



Yields equal to Paladin Pic, MB, and 3-WAY + herbicides.

Herbicide Program Tomato

Herbicide Program for Tomato CURRENTLY:

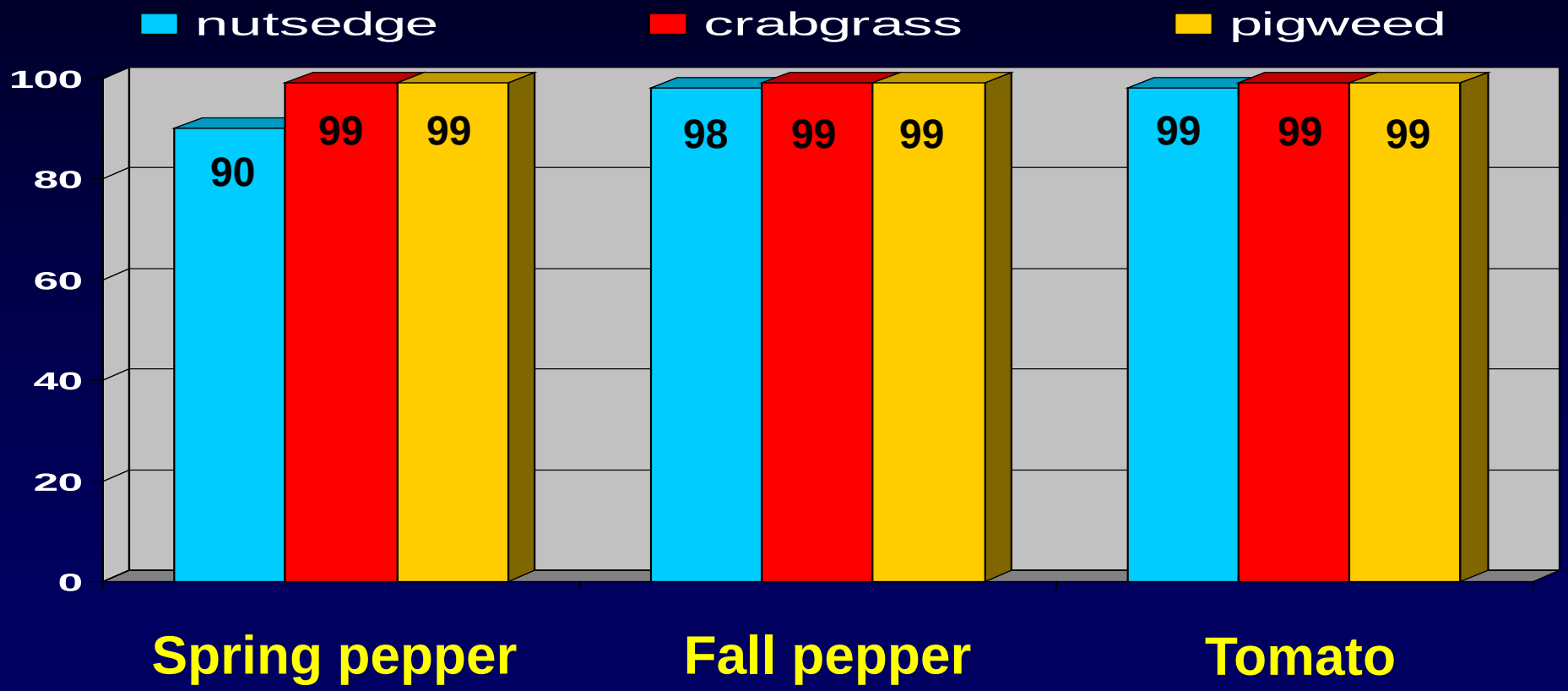
1. Devrinol + Dual Magnum preplant under mulch. (Metribuzin?)
2. Sandea POST
3. Select Max without adjuvant as needed (grass <3 inch)

Herbicide Program for Tomato SOON:

1. Devrinol preplant under mulch. (Metribuzin?)
2. Dual Magnum applied topically 7 to 10 d after transplant
3. Sandea POST
4. Select Max without adjuvant as needed (grass <3 inch)

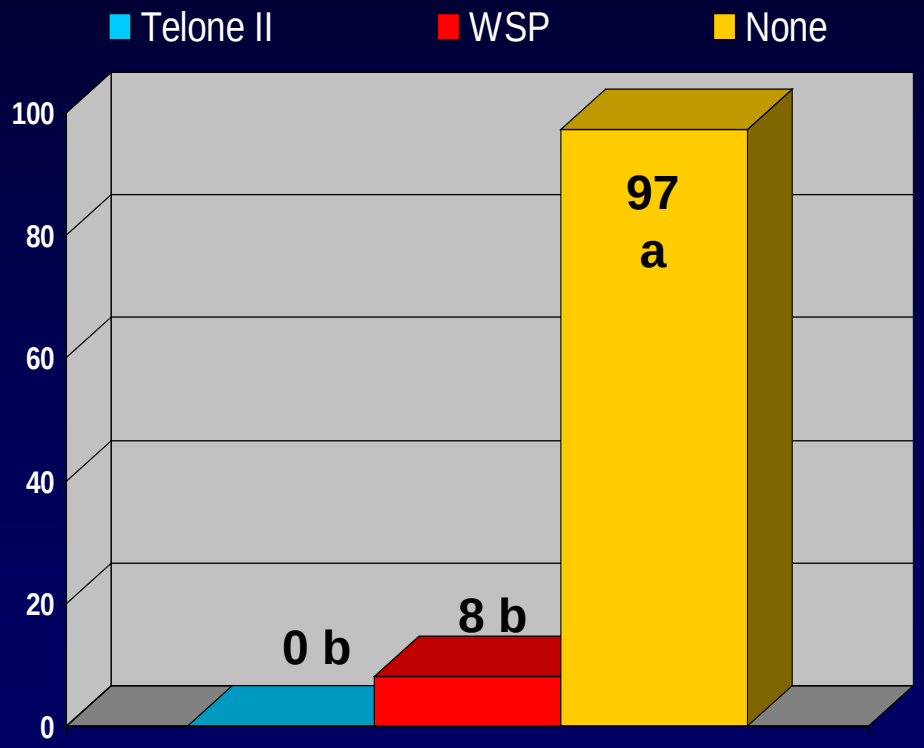
Several of these labels are for GA growers only. Reflex label for pepper expected early 2012.

Percent weed control by the WSP + Herbicide Program. 2011

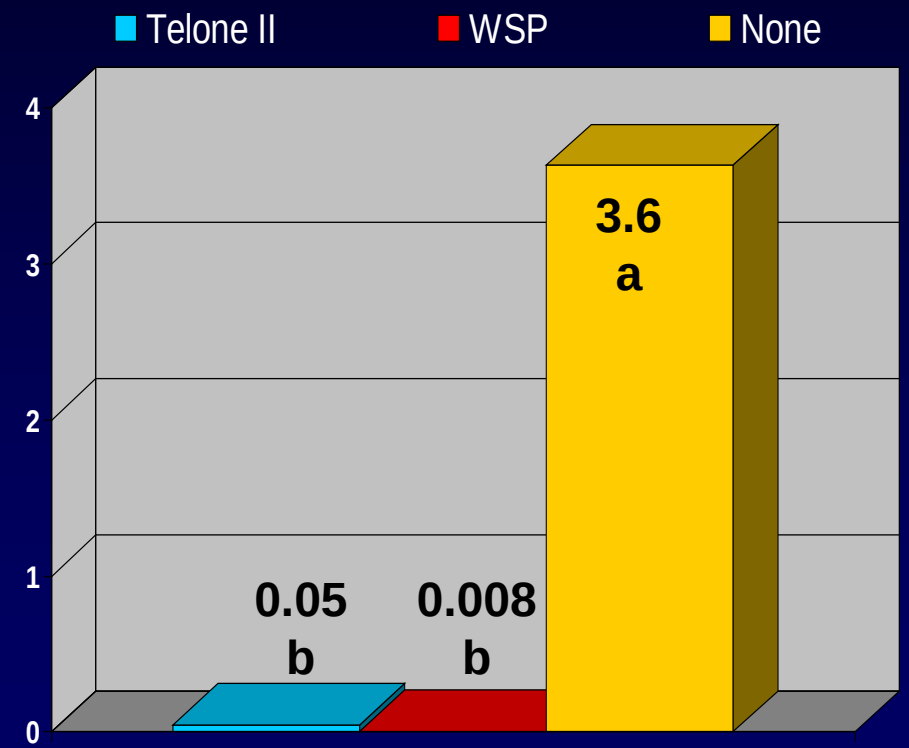


Yields equal to Paladin Pic, MB, and 3-WAY + herbicides.

Response of Root Knot nematode to the WSP. Langston, 2010.



Incidence



Severity

The Do's and Don'ts of Testing TE-3

- The philosophy of combining fumigants is good.
  - Combination may prove to be more efficacious than any one ingredient alone.
  - Reduces your buffer zones as compared to any one ingredient.
- The Nursery Cooperative and other grower commodities have tested the individual ingredients in many trials with no negative plant effects.
- The odor problem with TE-3 is not as offensive as when we tested DMDS alone. But, the odor is still present.
  - To reduce the odor be sure that your soil moisture at the time of fumigation is proper for your soil type.
  - To reduce the odor be sure that you breakup as much of the previous crop residue as possible.

The Do's and Don'ts of Testing TE-3

- Try 350 lb/a under TIF alone – not HDPE.
- Plant –Back times - be aware
  - The plant-back interval is lengthened with (1) heavy soils, (2) low soil temperatures, (3) high soil moisture
  - With 79-21 in bed row fumigation
    50-54°F – 42 days
    55-60°F – 35 days
    61-70°F – 28 days
    71°F + - 21 days
- Keep the plastic down 7-10 days after fumigation. The TIF plastic does not have the tear and blow-away problems associated HDPE plastic

The Do's and Don'ts of Testing TE-3

- Pick a problematic weed unit to test the compound.
- Limit your first year test to one unit or 1 acre so you can evaluate it on your soils.

Other fumigation items……

Mole knife – H&D change

Deeper fumigation (12”)
Creates a horizontal hole for fumigant
and seals the “chimney” above
the injection point.

HDPE or TIF in 2013

- The choice is yours
- H&D has a stock of HDPE it would like to use
- If buffer zones are not an issue – you can save $ by using HDPE
- You can use a combination of HDPE and TIF to address the buffer zones for your nursery

- TIF is new – we don't know impact on endomychozzhizae.

Hot glue & TIF

- H&D has been experimenting with a TIF glue that does not require heat
- H&D still intends to build more hot glue rigs


Any Questions?