



Florida Tomato Institute  
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# **Fumigation Practices and Challenges among Florida Tomato Growers: Survey Results**

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# Introduction

- Approximately 32,400 acres of tomatoes were harvested in Florida during the 2010-2011 season representing a total value of over \$564 million
- Growers are successfully producing crops with the use of MeBr alternatives
- Growers are noticing increased pest pressure and production costs with the continued use of alternatives

# Survey Objectives

- Determine what fumigant alternatives and rates are being used among Florida tomato growers
- Determine what pest problems may be associated with these alternatives
- Determine what additional IPM practices are being used
- Determine production losses associated with the alternatives

# Survey Instrument

- Fumigant Usage
- Performance
- Problem Pests and Impacts
- Additional Integrated Pest Management Practices



# Tomato Fumigant Usage

- Total acreage covered: 32,853/38,200 acres
- Double cropped: 4,198 acres with melons
- Did the use of alternatives affect your ability to double crop?: No
- What type of plastic mulch do you use?  
Standard: 31%, VIF: 51%, Metalized: 18%
- Crop injury: 24% indicated crop injury, PicClor 60 in fall/winter/spring, low temperatures and high soil moisture, herbicide toxicity



Fumigant	Rate/acre	Acres Treated
Methyl Bromide 98:2	Not being used	Not being used
Methyl Bromide 67:33	Not being used	Not being used
Methyl Bromide 50:50	200 lb	15,336
Vapam	50 gal	50
K-Pam	42 gal	664
Telone C35	Not being used	Not being used
Inline	Not being used	Not being used
Telone II	Not being used	Not being used
Telone EC	Not being used	Not being used
Midas 50/50	180 lb	500
Midas 98/2	Not being used	Not being used
PicClor 60	202 lb	14,380
PicClor 60EC	195 lb	1,232
Metapicrin	130 lb	166



# Fumigant Ratings

Fumigant	Nematodes	Diseases	Weeds
	(1 – 10 scale) <sup>z</sup>		
<b>Methyl bromide 98:2</b>	<b>9.4a<sup>y</sup></b>	<b>9.4a</b>	<b>9.4a</b>
<b>Methyl bromide 67:33</b>	<b>8.8a</b>	<b>8.8ab</b>	<b>8.7ab</b>
<b>Methyl bromide 50:50</b>	<b>7.3ab</b>	<b>7.3abc</b>	<b>6.8abc</b>
<b>Vapam</b>	<b>3.7bcd</b>	<b>5.3abc</b>	<b>5.3abc</b>
<b>K-Pam</b>	<b>2.5d</b>	<b>5.5abc</b>	<b>6.3abc</b>
<b>Telone C35</b>	<b>7.5ab</b>	<b>6.0abc</b>	<b>4.0c</b>
<b>Inline</b>	<b>7.0ab</b>	<b>7.0abc</b>	<b>7.0abc</b>
<b>Telone II</b>	<b>8.0a</b>	<b>5.0bc</b>	<b>5.0bc</b>
<b>Midas 50/50</b>	<b>7.4ab</b>	<b>6.6abc</b>	<b>6.0abc</b>
<b>Midas 98/2</b>	<b>5.5abcd</b>	<b>4.5c</b>	<b>4.8bc</b>
<b>PicClor 60<sup>x</sup></b>	<b>6.8abc</b>	<b>6.4abc</b>	<b>5.4abc</b>
<b>PicClor 60EC<sup>w</sup></b>	<b>6.5abc</b>	<b>6.5abc</b>	<b>8.5ab</b>
<b>Metapicrin</b>	<b>3.0cd</b>	<b>7.0abc</b>	<b>0.0d</b>
<b>P-value</b>	<b>0.0009</b>	<b>0.02</b>	<b>0.002</b>
<b>Significance</b>	<b>***</b>	<b>*</b>	<b>**</b>

Rating scale: 0 = no control, 10 = complete control

 Pest Problem	Acres Affected last Season	Pest Problem Increasing (yes or no)	Fumigants used last season where there was a pest problem	Production Loss %	Additional Control Measures
Nutsedge	7,654	yes	MBr 50:50/PicClor 60	10	Dual/Sandea/Roundup/hand weeding
Root Knot Nematode	676	yes/no	MBr 50:50	22	Vydate
Sting Nematode	59	yes	MBr 50:50/Kpam	15	Dazital
Charcoal Rot	55	yes/no	MBr 50:50/PicClor 60	No losses	No treatments
Phytophthora	762	yes	MBr 50:50/PicClor 60	8	Ridomil/Nutriphite
Fusarium Wilt	2,887	yes	MBr 50:50/PicClor 60	16	Ridomil
Southern Blight	1,680	yes	PicClor 60	10	No treatments
Bacterial Wilt	650	yes	PicClor 60	5	No treatments
Fusarium Crown Rot	2,347	yes	PicClor 60	4	Resistant var/Ridomil
Purslane	1,985	yes	PicClor 60/MBr 50:50	1.5	herbicides/hand weeding
Smartweeds	960	yes	PicClor 60	1.5	Clethodim
Carolina Geranium	20	yes	MBr 50:50	10	hand weeding
Other:	1,000	yes	PicClor 60/MrBr 50:50	No losses	No treatments



**Fall 2012 – Tomato Field with Fusarium Crown  
and Root Rot – Manatee Co. FL**





# Spring 2013 – Tomato Field with Fusarium Wilt – Manatee Co. FL







# General Consensus - Tomato

- Periodic cleanup of MeBr: **Yes**
- Primary pest problems: **Fusarium Wilt, Fusarium Crown Rot, Nutsedge, Southern Blight, Root Knot Nematode**
- True alternative: **No**, if so which ones?  
**PicClor 60**
- Average production losses: **8%**
- Future of vegetable and fruit production relies on fumigation: **Yes**

# Survey Conclusions

- Percentage of tomato acreage surveyed: 86%
- The majority of growers are using VIF mulch
- Most common fumigants in tomato: MeBr 50:50, PicClor 60
- Growers may need a periodic clean up of MeBr for problem pests.

# FFVA 2012 Survey

- Covered 68% of Florida tomato acreage
- Supports 2011 survey data
- In 2012, PicChlor60 surpassed usage of MBr 50:50
- Loss estimates due to pests differed

# Current Issues 2011/2012

## Survey

### Tomatoes

- Nematodes Increasing -- Losses in Range of 1-3% per Year
- Weed Populations Increasing and Diversity of Weed pressure increasing with losses in the range of 3-5%
- Soil Borne Pathogens depending on environmental conditions losses as high as 10 -20%
- Emerging pathogens – Southern Blight

# MEBR Rescue Treatments

- Discussed in 2014 Round CUE Petition (2011)
- Initiated Research and Survey Efforts in 2012 to Generate Needed Information
- Submitted 2015 supplemental request with 2016 Round CUE Petition due August 29, 2013

# Basis of Request

- “Rescue treatment” needed where alternatives have been utilized.
- Lack of efficacy in alternatives and emerging pest issues with repeated use.
- Base treatment request either, 175 pounds MeBr formulated with Chloropicrin in a 67:33 ratio per treated acre under VIF or 135 – 140 pounds MeBr formulated with Chloropicrin in a 67:33 ratio per treated acre under TIF.
- Request will be for a portion of total production acreage that meets certain criteria.
- Estimated total Amount: 766.440 mt



# Information Compiled

- ◉ Supporting information from the farm level on economic and production impacts of implementation of alternatives.
- ◉ Documentation of yield and/or quality issues with alternatives.
- ◉ Data and Supporting Research information from the Research and Extension Community.
  - ◉ Definition of scope and magnitude
  - ◉ Yield and efficacy

# Where are we now?

- Final decision for “rescue” treatment will not be made until Fall 2014
- If a grower has material in hand that was purchased prior to the end of 2013 that has the 2005 use label, they can legally use that product.
- 2013 CUE allotment is 2.2% of 1991 baseline
- No MeBr available to be packaged for use by Florida strawberry, tomato, or eggplant growers.

# What can we do?

- ◉ Continued focused research
- ◉ New products
- ◉ Grower documentation
- ◉ Future surveys to focus on cost comparison of MeBr to alternatives
- ◉ Positive outlook

# Thanks!

- ◉ Growers
- ◉ Dan Botts and the FFVA
- ◉ Dr. Zhengfei Guan
- ◉ Dr. Monica Ozores-Hampton and the survey team