Comparing MB Alternatives In Large Acreage On Farm Trials (2008)

University of Georgia

Tifton Campus

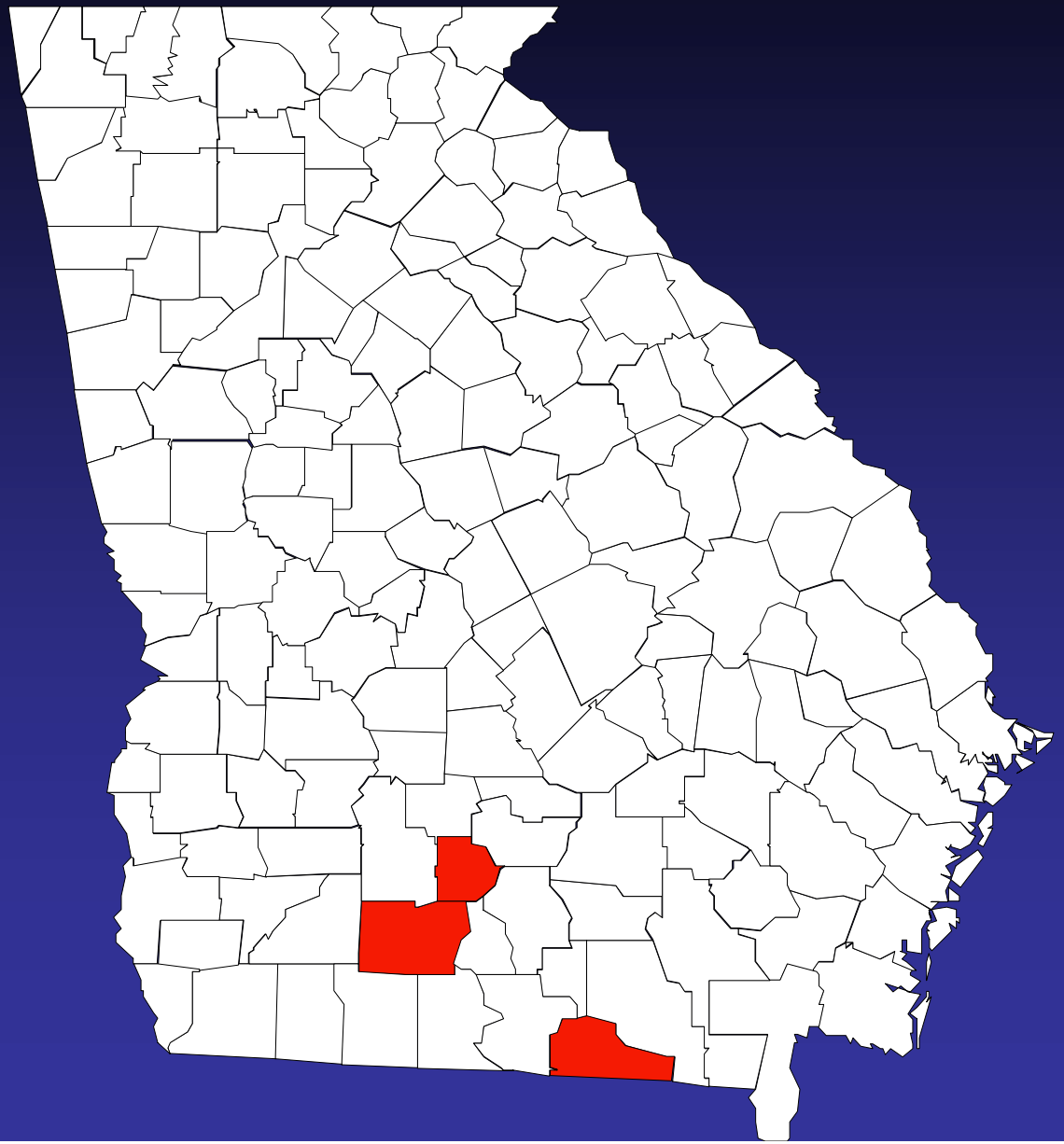
Culpepper, Webster, Rucker,

Sumner, Beard, Langston, Mayfield

Potential MB Alternatives

1. MIDAS 67:33 (methyl iodide + chloropicrin)
2. DMDS 79:21 (dimethyl disulfide + chloropic.)
3. Telone II fb chloropicrin fb Vapam (3 WAY)

2007 On Farm Replicated MB Alternative Trials



2007

Treatments

Fumigant and mulch options:

1. 3 WAY under LDPE
2. MIDAS under VIF
3. DMDS under LDPE
4. MB under LDPE

Fumigant Rates in Broadcast

	Loc. 1	Loc. 2	Loc. 3
MB	400	366	357
MIDAS	171	170	174
DMDS	76	74	71
3-WAY*	10/124/75	16/150/75	11/150/75

*Gal of Telone II/ Lbs of chloropcirin/ Gal. of Vapam


MB, MIDAS, DMDS
application 8” deep


Telone II Application
12 to 14 “ deep
Yetter
Yetter


Chloropicrin placed 8 inches deep

Metam Application with blades 4” apart applying metam 4” deep

Plot size: 3 rows by 1200 feet, 700 feet or 600 feet

Replications: 4 at each location

Pepper as spring crop and cucumber as fall crop

Measurements taken:

1. Weeds emerging through mulch or plant hole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Measurements taken:

1. Weeds emerging through mulch or plant hole
2. Crop heights or runner lengths
3. Pathogens
4. Nematodes
5. Yield (2 to 4 times for both crops)


876 pepper bins harvested


OIL-DRI
EZGO


FORCED AIR COOLED
BELL PEPPERS
SOUTHERN VALLEY
PEPPERS
PRODUCE OF U.S.A.

Weed Response to Methyl Bromide Alternatives. Spring 2007

Pitted morningglory: (2 loc)

Smallflower morningglory: (2 loc)

Pink purslane: (2 loc)

Carpetweed: (1 loc)

Nutsedge: (2 loc)

Amaranth: (2 loc)

Weed Response to Methyl Bromide Alternatives. Spring 2007

Pitted morningglory: (2 loc)

Smallflower morningglory: (2 loc)

Pink purslane: (2 loc)

Carpetweed: (1 loc)

Nutsedge: (2 loc)

Amaranth: (2 loc)

Number of Nutsedge Plants/A with MB Alternatives in Pepper. Spring 2007.*

	Location 2	Location 3
MB	15 b	59 b
MIDAS	13 b	55 b
DMDS	48 a	172 a
3-WAY	13 b	25 b

Number of Amaranth Plants/A with MB Alternatives in Pepper. Spring 2007.*

	Location 2	Location 3
MB	10 b	2 b
MIDAS	15 b	16 b
DMDS	220 a	206 a
3-WAY	2 b	0 b


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Root-Knot Nematode Response to MB Alternatives. Spring 2007.*

	Location 1	Location 2
MB	12 a	5 a
MIDAS	17 a	3 a
DMDS	103 a	6 a
3-WAY	191 a	1 a

*Number of nematodes per 100 cm^3 soil.

Bell Pepper Heights Comparing Methyl Bromide Alternatives. Spring 2007.*

	Loc. 1	Loc. 2	Loc. 3
MB	24.3	14.3	14.7
MIDAS	23.9	13.9	14.5
DMDS	24.1	14.9	14.0
3-WAY	24.1	14.7	14.7

*Heights taken 3 to 5 WAP.

Boxes of Bell Pepper for Total Harvest. Data presented as % of MB. Location 1.*

	Jumbo	X-Large	Large	Chopper
MB	100 a	100 a	100 a	100 a
MIDAS	98 a	97 a	88 a	104 a
DMDS	85 b	88 a	85 a	94 a
3-WAY	110 a	85 a	84 a	107 a

*Data totaled over three harvests.

MB fruit: Jumbo (14%), X-Large (32%), Large (27%), and Chopper (26%).

Boxes of Bell Pepper for Total Harvest. Data presented as % of MB. Location 2.*

	Jumbo	X-Large	Large	Chopper
MB	100 b	100 a	100 a	100 ab
MIDAS	112 ab	101 a	95 a	90 c
DMDS	100 b	97 a	98 a	94 bc
3-WAY	125 a	99 a	70 b	105 a

*Data totaled over two harvests.

MB fruit: Jumbo (17%), X-Large (54%), Large (9%), and Chopper (20%).

Boxes of Bell Pepper for Total Harvest. Data presented as % of MB. Location 3.*

	Jumbo	X-Large	Large	Chopper
MB	100 b	100 a	100 a	100 b
MIDAS	101 ab	92 a	87 a	94 b
DMDS	96 b	82 b	96 a	103 b
3-WAY	108 a	74 b	75 a	132 a

*Data totaled over four harvests. For MB, fruit was Jumbo (60%), X-Large (23%), Large (7%), and Chopper (10%).

Costs of Fumigant and Mulch.*

	Loc. 1	Loc. 2	Loc. 3
MB	$1184	$1039	$1020
MIDAS	$1515	$1510	$1531
DMDS	?	?	?
3-WAY	$799*	$843	$812

*Charge of $35 added to 3 way for additional application costs.

Pepper Fruit Value, Spring 2007.

Jumbo ($9.69)

X-Large ($9.23)

Large ($9.68)

Chopper ($5.50)

Bell Pepper Value for Total Harvest As A Percent of MB*

	Loc. 1	Loc. 2	Loc. 3
MB	100 a	100 ab	100 a
MIDAS	92 a	97 b	94 b
DMDS	?	?	?
3-WAY	96 a	105 a	100 a

*Prices for pepper size are as follows: Jumbo ($9.69), X-Large ($9.23), Large ($9.68), Chopper ($5.50).

CONCLUSIONS FOR PEPPER

1. MIDAS: could be drop in replacement for methyl bromide but currently not economical
2. 3 WAY: effective alternative for MB in the spring and will cause a change in fruiting structure
3. DMDS: not as effective as MB applied under LDPE mulch

Fall Cucumbers

Treatments between spring and fall crops

Metam: 20 – 30 gal all locations

Telone EC: 1 location

Glyphosate or paraquat: all locations

Weeds Present in Fall Cucumber

Pitted morningglory: (2 loc)

Smallflower morningglory: (2 loc)

Pink purslane: (2 loc)

Nutsedge: (3 loc)

Amaranth: (3 loc)

Weeds Present in Fall Cucumber

Pitted morningglory: (2 loc)

Smallflower morningglory: (2 loc)

Pink purslane: (2 loc)

Nutsedge: (3 loc)

Amaranth: (3 loc)

Number of Nutsedge Plants/A with MB Alternatives in Pepper. Fall 2007.*

	Loc. 1	Loc. 2	Loc. 3
MB	0 b	25 b	954 b
MIDAS	22 b	25 b	685 b
DMDS	134 a	70 a	1689 a
3-WAY	16 b	40 b	236 b

Number of Pigweed Plants/A with MB Alternatives in Pepper. Fall 2007.*

	Loc. 1	Loc. 2	Loc. 3
MB	60 b	210 b	13 b
MIDAS	56 b	282 b	9 b
DMDS	164 a	490 a	126 a
3-WAY	80 b	280 b	5 b

Root-Knot Nematode Response to MB Alternatives. Fall 2007.*

	Location 1	Location 2
MB	25 a	0 a
MIDAS	48 a	12 a
DMDS	5 a	0 a
3-WAY	29 a	1 a

*Number of nematodes per 100 cm^3 soil.

CUCUMBER YIELDS

1. No differences in maturity or yield with any harvest and any location.

Cucumber Fruit Value Per Box, Fall 2007.

Super ($12.50)

Select ($8.00)

Small ($10.00)

Large ($6.00)

Carton ($4.00)

CUCUMBER YIELDS

1. No differences in maturity or yields.
2. No differences in value.

Value of Cucumber as a Percent of the MB. Fall 2007.*

	Loc. 1	Loc. 2	Loc. 3
MB	100	100	100
MIDAS	99	101	107
DMDS	94	97	99
3-WAY	99	102	110

Returns of Spring Pepper and Cucumber as a Percent of the MB. Fall 2007.*

	Loc. 1	Loc. 2	Loc. 3
MB	100	100	100 a
MIDAS	93	99	95 b
DMDS	?	?	?
3-WAY	96	104	101 a

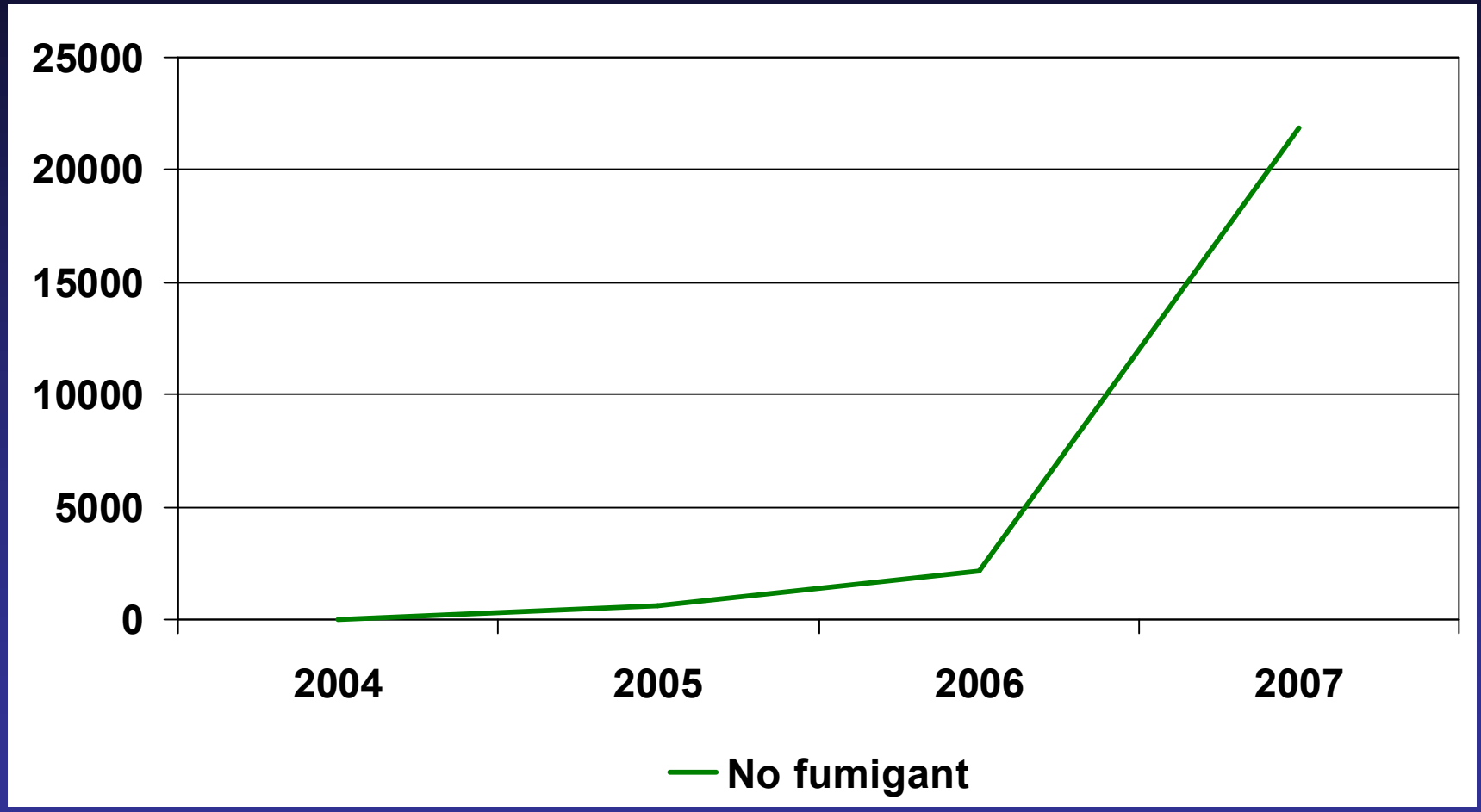
*Determined by adding value of pepper and cucumber and subtracting cost of fumigant and mulch.

CONCLUSIONS SPRING PEPPER FOLLOWED BY FALL CUCUMBER

1. MIDAS: could be drop in replacement for methyl bromide but currently not the most economical option
2. 3 WAY: effective alternative for MB in the spring
3. DMDS: not as effective as MB when applied under LDPE mulch

Are these alternatives sustainable?

Long term impacts of fumigant systems on nutsedge populations per acre.*



*Long term study with spring pepper and fall cucumber treated with same fumigant each year. Herbicides applied b/w crops.

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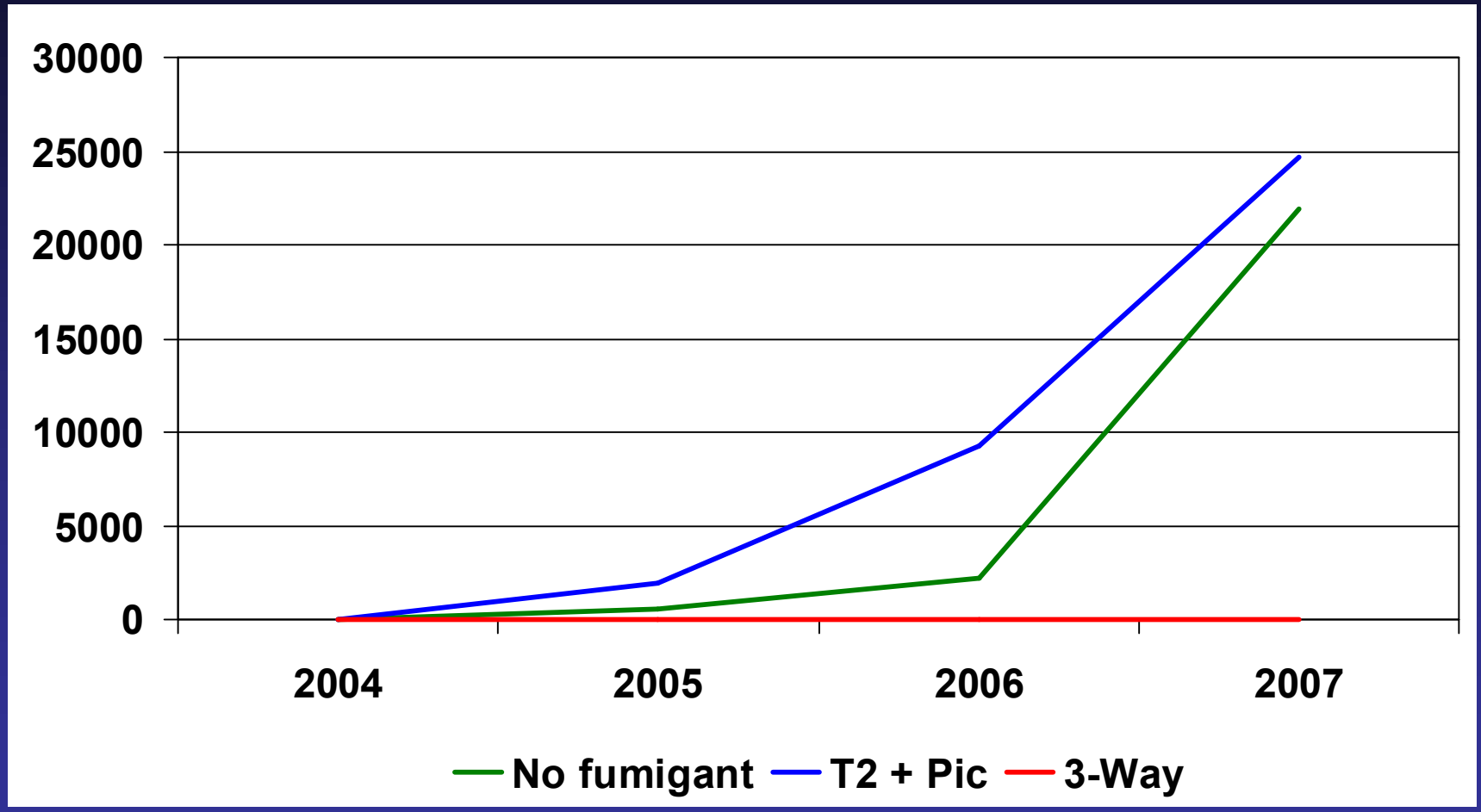

*Long term study with spring pepper and fall cucumber treated with same fumigant each year. Herbicides applied b/w crops.

DMDS 74 G, LDPE

DMDS 56 G, VIF

DMDS 60 G, VIF

DMDS 70 G, LDPE

DMDS 60 G, VIF

MB

ON FARM COOPERATORS

Bill Brim, LTF

Martin Flora, SVP

Russ Hamlin, CF

Support from:

1. MB area wide project
2. CSREES Transition
3. All Fumigant Manufacturers
4. Hendrix and Dail