2015 Vegetable Fumigant Systems For Plasticulture in Georgia

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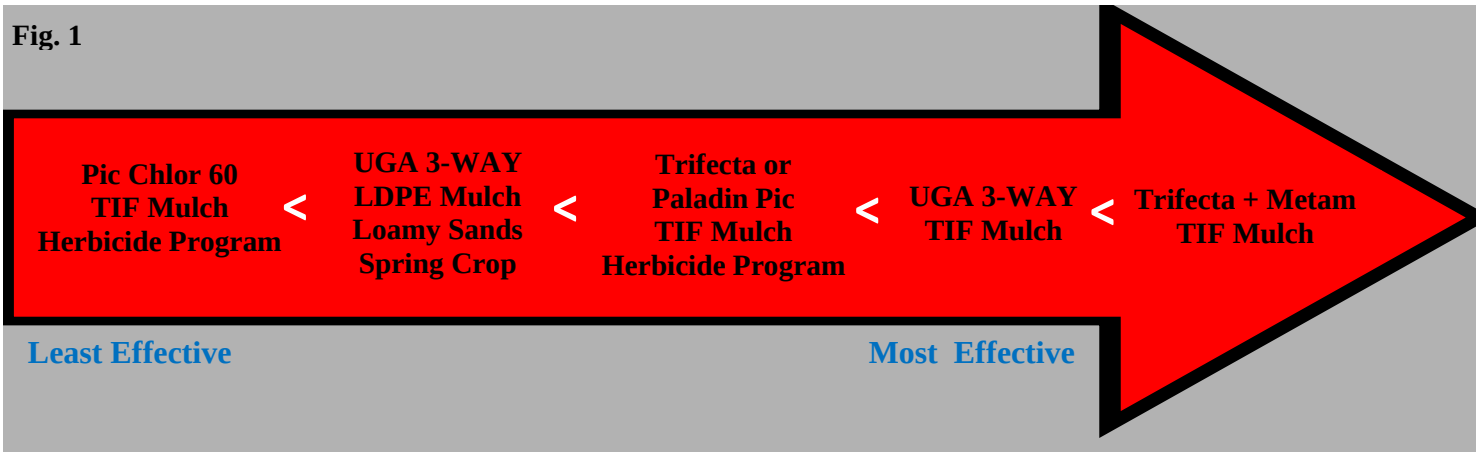
Effective alternatives to methyl bromide exist but selecting the ideal fumigant, mulch, and herbicide program is challenging. Growers must better understand how soil texture, moisture, bed compaction, and their cultural practices influence fumigant activity, planting intervals, and off-gassing concerns. This circular is provided to assist growers with developing the most effective fumigant system for their farm. Figure 1 compares the most effective fumigant options followed just below by more detailed information regarding each system. Off-gassing, fumigant plant back intervals, and ways of improving economic sustainability are addressed on the back.

Fig. 1



FUMIGANT OPTIONS (rates provided as broadcast only):

1. The UGA 3-WAY includes Telone II at 12 GPA, chloropicrin at 150 lb/A, and metam sodium (Vapam, etc.) at 75 GPA. Telone II is typically applied 12-16" deep while chloropicrin is placed 8-10" deep; both fumigants are applied using 3 knives spaced evenly across a typical 32" wide bed. Metam must be placed in the final bed with injection points 4" deep and 4" apart (Fig. 2). If replacing Telone II and chloropicrin with Pic Chlor 60, the rate of at least 21 GPA is in order but one may experience less nematode control. An LDPE mulch is effective for loamy sand soils during spring fumigation of fields lightly infested with nutsedge; however, a TIF mulch would be far more effective in controlling nutsedge on sandy soils, during summer fumigation, and in fields with heavy nutsedge infestations.

2. Trifecta is a mixture of Telone II, chloropicrin, and DMDS. Apply at 350-400 lb/A under an approved TIF mulch at a depth of 8-10"; use higher rates for intense nutsedge populations and on sandy soils. An herbicide program must be included in the system as small seeded broadleaf weeds and grasses are not controlled adequately. Care must be taken to avoid off-target odor issues (see back).

3. Trifecta + Metam has proven to be the most consistently effective system during the past two years of research. Trifecta at 325-350 lb/A should be injected 8-10" deep followed by 50-75 GPA of metam sodium (Vapam, etc.) placed in the final bed with injection points 4" deep and 4" apart (Fig. 2). Research has shown a strong potential of using Trifecta at 300 lb/A followed by metam at 50 GPA; however, additional research is needed during 2015 focusing on controlling intense nutsedge populations and nematodes at these lower rates.

4. Paladin Pic includes a 79:21 mixture of DMDS:chloropicrin and should be injected at 40-50 GPA at a depth of 8-10" under TIF mulch; use higher rates for intense nutsedge infestations. The system is effective on nutsedge but poor control of annual grasses and broadleaf weeds are expected; thus, an herbicide program is required. Paladin has a distinct odor and applicators must be careful to avoid off-target odor issues (see back).

5. Pic Chlor 60 applied under TIF mulch at 28 GPA (340 lb/A) can be an effective option, especially when 1) producing only 1 or 2 crops prior to mulch removal, 2) applying in fields containing light nutsedge and nematode infestations, and 3) when growing crops that allow topical use of Sandea herbicide. In most fields, this fumigant system should be accompanied by an herbicide program for the control of annual weeds.

Fig. 2: UGA 3-WAY

Ideal Placement

Metam (Vapam, etc.) = 4 inches

Chloropicrin = 8-10 inches

Telone II = 12-16 inches

Applicators for injecting metam 4" deep and 4" apart in the final bed

DO I REALLY NEED THE BEST FUMIGANT SYSTEM?

More Important:

1. At least 3 crops produced on mulch.
2. High nutsedge populations.
3. Cropping sequence prevents Sandea use.

Less Important:

1. Light nutsedge populations.
2. Cropping sequence allows Sandea use.
3. One or two crops produced on mulch.

AVOIDING OFF-GASSING

1. **Blow-out valves should be used to allow applicators to purge fumigants from lines prior to raising shanks from the soil. Dripping fumigants on field ends is currently the No. 1 odor causing issue in GA.**
2. **It is critical to fumigate in soils with ideal moisture but to also implement proper bed compaction & mulch type. Proper bed compaction increases uniform fumigant, water, and fertilizer movement.**
3. **All fumigated areas should be covered with mulch immediately.**
4. **Field ends should not be worked until at least 10 to 14 d have passed since application.**
5. **Fumigant equipment should not be parked or unhooked in areas where pedestrians/workers visit or near occupied structures until thoroughly and properly cleaned.**
6. **Valves must be off, system depressurized, and fumigant lines disconnected after each application.**

FUMIGANT PLANT BACK INTERVALS

1. **The longer fumigants remain in the soil, the greater the level of pest control usually achieved. Some fumigant systems are so effective that they can remain in soils for over 30 d in the spring and over 21 d in the fall; thus, check beds carefully for fumigant presence prior to planting.**
2. **TIF mulch will increase plant back interval of most fumigants; check beds prior to planting.**
3. **Wet conditions often trap fumigants in the bed and can be problematic, especially with Telone II.**

REDUCING FUMIGANT COSTS OVER TIME

A direct correlation between fumigant rates and nutsedge populations has been identified. Thus, more aggressive and costly systems are needed in fields with intense nutsedge populations. To reduce costs over time, a holistic approach to nutsedge management is required. A few management options to consider:

1. **Always manage nutsedge between rows of plasticulture; Sandea is available for many crops.**
2. **Always terminate the crop and weeds (especially nutsedge) as soon as harvest has been completed.**
3. **Rotate a full use rate of Roundup with disking when crops and mulch are not present (3 wk intervals).**
4. **Rotate Roundup and Gramoxone when crop is not present but mulch is present; wash mulch prior to planting.**

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