Mark Hoffmann, Ass. Prof., NCSU, Dep. of Horticulture, Raleigh NC
Austin Wrenn, M.S. Student, NCSU, Dep. of Horticulture, Raleigh, NC
Abby Whitaker, M.S., NC Cooperative Extension

EVALUATION OF Sectagon AND SoilMend AS MULTI-TACTIC FUMIGANT IN SOUTHEASTERN STRAWBERRY PRODUCTION

M. Hoffmann[1], A. Wrenn[1], A. Whitaker[2]

[1]North Carolina State University, Department of Horticultural Sciences, Raleigh NC

[2]North Carolina Cooperative Extension, Rockingham NC

Summary

Weed and pathogen control efficacy of Sectagon (Metam-Sodium) and Lime Sulfur Solution (SOILMEND; Lime Sulfur) as well as marketable yield was evaluated in two strawberry field trials in North Carolina. The locations are in Castle Hayne, NC and Clayton, NC. Delivery problems due to Hurricane Irma led to only a subset of application at the research plot in Clayton.

Drip applications of Sectagon (62 gal/a), Pic-Clor 60 (35 gal/a), Dominus (40 gal/a) and shank applied Pic-Clor 60 (35 gal/a) were compared to drip applied SOILMEND (90 gal/a), Sectagon (31 gal/a) fb. Dominus (30 gal/a) and Sectagon (31 gal/a) fb. SOILMEND (90 gal/a). All applications were done under TIF plastic film. Sectagon (31 gal/a) fb. SOILMEND (60 gal/a) showed good weed and pathogen control and second highest yield at the field site in Clayton. However, those results were not confirmed at the field site in Castle Hayne. Clocking of the dripline after application of SOILMEND was observed in all field trials.

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Material and Methods

Sectagon, SOILMEND, Dominus and Pic-Clor 60 were applied through drip line (2 rows of drip tape) under TIF plastic. A total area of 440 ft^2 was treated per application. See Table 1 for application dates at the two locations.

All treatments are repeated four times and arranged in a randomized complete block design. Strawberry plants (*Fragaria* x *ananassa* 'Camarosa') were transplanted on October 12th 2017 (Clayton NC) and October 23th 2017 (Castle Hayne NC). To evaluate weed control efficacy, weed counts and weed biomass in planting holes were taken. To evaluate the efficacy of the fumigation on survival of *Pythium spec.*, pre- and post fumigation soil samples were taken and processed in our laboratories. Data will be analyzed using standard statistical methods (ANOVA and post-hoc Fisher LSD, α=0.05) in R v3.3.0. Due to Hurricane Irma, Dominus could not be applied in Clayton. In Clayton, malfunctioning equipment may have compromised the Pic-Clor 60 applications.

Table 1: Application rates and dates of fumigants at the strawberry field trials in Castle Hayne, NC (2017/18) and Clayton. NC (2017/18).

Treatment	***Rate***	***Method***	***Date Castle Hayne***	***Date Clayton***
Dominus	*40 gal/a*	*Drip*	*9/29/2017*	-
Sectagon	*62 gal/a*	*Drip*	*9/28/2017*	*9/22/2017*
Pic-Clor 60	*35 gal/a*	*Drip*	*9/28/2017*	*9/21/2017*
Pic-Clor 60	*35 gal/a*	*Shank*	*9/20/2017*	*9/11/2017*
Sectagon fb.	*31 gal/a fb.*	*Drip*	*9/29/2017 fb.*	*9/22/2017 fb.*
Dominus	*30 gal/a*	*Drip*	*9/29/2017*	-
Sectagon fb.	*31 gal/a fb.*	*Drip*	*9/29/2017 fb.*	*9/22/2017 fb.*
SOILMEND	*90 gal/a*	*Drip*	*9/29/2017*	*9/22/2017*
SOILMEND	*90 gal/a*	*Drip*	*9/29/2017*	*9/22/2017*
NTC	-	-	-	-

Results

1. *Weed Control*

Weed growth was suppressed by Sectacon fb. SOILMEND and Sectagon fb. Dominus multi-tactic applications. Weed densities in Sectagon/SOILMEND combined treatments were between 5.5 and 6.75 weeds/planting hole (Table 2). Dominus applications could be performed in Clayton. Weed evaluation are ongoing and another weed growth is expected in early Spring.

Table 2: Weed control efficacy.

Treatment	***Rate***	***Weeds/planting hole Castle Hayne***	***Weeds/planting hole Clayton***
Dominus	*40 gal/a*	*16.75 abc*	-
Sectagon	*62 gal/a*	*2.5 bc*	*2.5 c*
Pic-Clor 60	*35 gal/a*	*9 bc*	*2.5 c*
Pic-Clor 60	*35 gal/a shank*	*1.75 c*	*31.25 a*
Sectagon fb. Dominus	*31 gal/a fb. 30 gal/a*	*3.5 bc*	-
Sectagon fb. SOILMEND	*31 gal/a fb. 90 gal/a*	*5.5 bc*	*6.75 b*
SOILMEND	*90 gal/a*	*23 ab*	*22.5 b*
NTC	-	*26 a*	*37.8 a*

2. *Pathogen Control*

Pythium spec. was controlled by Sectagon, Pic-Clor 60 (drip) and Sectagon f.b. SOILMEND (Table 3). SOILMEND alone did not control the growth of *Pythium* spec. At both field sites, an average of 8 propagules per g soil could be found post fumigation with Sectagon (31 gal/a) and a 90 gal/a Soilmend application. Pic-Clor 60 application as Clayton did not control Pythium, but

might have been compromised by severe weather conditions shortly after fumigation (Hurricane Irma).

Table 3: Pathogen control efficacy. *Pythium* spec. levels (ppg) in post-application soil samples.

Treatment	***Rate***	***Pythium (ppg soil) Castle Hayne***	***Pythium (ppg soil) Clayton***
Dominus	*40 gal/a*	*20 c*	*-*
Sectagon	*62 gal/a*	*10.6 c*	*0 b*
Pic-Clor 60	*35 gal/a*	*26 bc*	*872 a*
Pic-Clor 60	*35 gal/a shank*	*128 bc*	*800 a*
Sectagon fb. Dominus	*31 gal/a fb. 30 gal/a*	*16 c*	*-*
Sectagon fb. SOILMEND	*31 gal/a fb. 90 gal/a*	*8 c*	*8 b*
SOILMEND	*90 gal/a*	*448 a*	*624 a*
NTC	*-*	*272 ab*	*641 a*

3. Yield

Berries were picked in Castle Hayne once a week for five weeks from 4/11/2018 to 5/16/2018. Berries were picked in Clayton twice a week for six weeks, from 4/19/2018 – 5/31/2018. Yield at the field site in Castle Hayne was compromised due to wildlife and rain damage.

In Castle Hayne, Pic-Clor 60 treatments and Sectagon fb. Dominus had high yields, while the Soilmend 90gpa and the Sectagon fb. Soilmend treatment yielded lower than the NTC. In Clayton however, Sectagon fb. Soilmend yielded at the same level as a Pic-Clor 60 shank applied treatment (Table 4).

Table 4: Marketable Yield through the North Carolina Spring-Production Season (4/11/2018 - 5/31/2018)

Treatment	***Rate***	***Yield (lbs/acre) Castle Hayne***	***Yield (lbs/acre) Clayton***
Dominus	*40 gal/a*	*8,865 bc*	*-*
Sectagon	*62 gal/a*	*8,703 bc*	*22,522 a*
Pic-Clor 60	*35 gal/a*	*10,182 a*	*20,299 a*
Pic-Clor 60	*35 gal/a shank*	*9,980*	*21,477 a*
Sectagon fb. Dominus	*31 gal/a fb. 30 gal/a*	*10,758 b*	*-*
Sectagon fb. SOILMEND	*31 gal/a fb. 90 gal/a*	*7,841 c*	*21,328 a*
SOILMEND	*90 gal/a*	*8,707 bc*	*19,079 a*
NTC	*-*	*9,173 bc*	*20,137 a*

Conclusions

Sectagon at 31 gpa followed by Soilmend at 90 gpa showed good weed and pathogen control as well as high yields at the field site in Clayton, NC. However, at the field site in Castle Hayne, Sectagon (31 gpa) f.b. Soilmend (90gpa) yielded significantly lower that the non treated control.