

# Fungicide and Insecticide Combinations for Management of Nematodes on Putting Greens

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## Objectives:

1. To determine if labeled rates of the fungicides iprodione and thiophanate methyl are effective against plant-parasitic nematodes in the field
2. To determine of combinations and rotations of iprodione and thiophanate methyl with abamectin (Avid) can improve nematicide effects.

A putting green at the University of Florida Plant Science Research Unit is being used for this trial. This green is planted with 'Jonesdwarf' bermudagrass and is naturally infested with sting nematode and root-knot nematode. The experiment was laid out in a randomized

block design, blocks were based on initial sting nematode population density, with 5 replications. Plots were 16 ft<sup>2</sup> with 2-ft untreated borders between adjacent plots. Applications of all treatments were made using a CO<sub>2</sub>-powered backpack sprayer with TJ-08 nozzles delivering

**Table 1: Treatment Schedule.**

Code	Treatment	Trade Name	Form. rate/1000 ft <sup>2</sup>	Amount/2 liters	Applications on Week
U	Wetting Agent Control	Lesco Wet	8 oz	21 ml	0,2,4,6,8,10,12
B	Iprodione	Iprodione SPC	8 oz	21 ml	0, 4, 8, 12
	Wetting Agent	Lesco Wet	8 oz	21 ml	0,2,4,6,8,10,12
C	Thiophanate Methyl	Cleary's 3336 Plus	8 oz	21 ml	0,2,4,6,8,10,12
	Wetting Agent	Lesco Wet	8 oz	21 ml	0,2,4,6,8,10,12
D	Abamectin	Avid 0.15 EC	0.61 oz	1.6 ml	0,2,4,6,8,10,12
	Wetting Agent	Lesco Wet	8 oz	21 ml	0,2,4,6,8,10,12
E	Iprodione	Iprodione SPC	8 oz	21 ml	0, 4, 8, 12
	Thiophanate Methyl	Cleary's 3336 Plus	8 oz	21 ml	0, 4, 8, 12
	Wetting Agent	Lesco Wet	8 oz	21 ml	0,2,4,6,8,10,12
F	Iprodione	Iprodione SPC	8 oz	21 ml	0, 4, 8, 12
	Thiophanate Methyl	Cleary's 3336 Plus	8 oz	21 ml	2, 6, 10
	Wetting Agent	Lesco Wet	8 oz	21 ml	0,2,4,6,8,10,12
G	Iprodione	Iprodione SPC	8 oz	21 ml	0, 4, 8, 12
	Thiophanate Methyl	Cleary's 3336 Plus	8 oz	21 ml	2, 6, 10
	Abamectin	Avid 0.15 EC	0.61 oz	1.6 ml	0,2,4,6,8,10,12
	Wetting Agent	Lesco Wet	8 oz	21 ml	0,2,4,6,8,10,12
H	Iprodione	Iprodione SPC	8 oz	21 ml	0, 4, 8, 12
	Thiophanate Methyl	Cleary's 3336 Plus	8 oz	21 ml	0, 4, 8, 12
	Abamectin	Avid 0.15 EC	0.61 oz	1.6 ml	2, 6, 10
	Wetting Agent	Lesco Wet	8 oz	21 ml	0,2,4,6,8,10,12



6 gallons/1000 ft<sup>2</sup>. After each application all plots were irrigated with 1/8-inch water.

The initial treatments were made on 22 April, 2014. Nematode samples consisted of nine 3/4-inch-diameter and 4-inch-deep soil cores collected from each plot. Nematodes were extracted from a 100 cm<sup>3</sup> subsample by the sugar-flotation/centrifugation method. Nematode samples were collected on 20 March (before treatment), 3 June, and 29 July. Root samples were two 1.5-inch-diameter cores taken 6-inches deep from each plot (174 cm<sup>3</sup> of soil from each core). Roots were extracted manually in water with a sieving technique. Root lengths were measured using WinRhizo equipment and software. Roots samples were collected on 22 April and 29 July. Turf percent green cover was a measure of how much of the plot area was covered by live turf. Percent green cover is determined by importation of a digital image from each plot into SigmaScan software and using a macro to determine the percentage of green pixels in the image. Green cover data was collected every two weeks.

Statistical analysis: All data was subjected to analysis of covariance with the initial measurement used as the covariant. Differences indicated are comparisons with the untreated controls using the actual P-value generated (P = 0.1, 0.05, 0.01), where no differences are indicated P > 0.1.

**Results:**

Our staff are still working through the root and nematode samples, so that data is not yet available. However, the turf percent green cover has been analyzed and is shown in Table 2. These results that iprodione yielded a slight increase in turf green cover, especially early in the season. Abamectin showed significant increase in percent green cover later in the trial. This is consistent with other abamectin field trials where turf improvement typically does not occur until after several applications. Overall, the best turf percent green cover was achieved by treatment G, which applied abamectin every two weeks and rotated among the two fungicides.

**Table 2. Effect of treatments on turf percent green cover in 2014.**

Treat code	22 Apr	6 May	20 May	3 Jun	16 Jun	1 Jul	15 Jul	29 Jul	12 Aug
U	7	14	11	21	36	15	16	10	10
B	6	13	16***	31***	44*	18	20*	12	11
C	7	12	12	22	42	18	15	10	6
D	7	11	12	26	52**	24**	41***	25***	27***
E	6	13	11	27**	43*	15	21**	13	10
F	6	8	10	20	39*	14	15	6	5
G	6	12	12	30***	63***	28***	49***	32***	26***
H	5	8	9	20**	44***	23***	32***	21***	13**

