

I'm not saying that all doors are closed in regard to turf bioengineering. Yes, the avenue of herbicide-resistant varieties has been derailed for five or 10 years. But advancements in drought, pest, and stress tolerance from bioengineering could begin appearing on the market as soon as 2005.

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RESEARCH SUMMARIES

**Controlling June Beetle Grubs, with surface-applied insecticides.** *Research conducted by Dr. Rick Brandenburg, NC State University.*

Several different treatments were evaluated for control of green June beetle grubs (*Cotinus nitida* L.) on a bermudagrass fairway at the Quali Ridge Golf and Country Club in Sanford, NC.

Turfgrass on the site was mowed at 7/8-inch, with 1/4-inch of thatch present. The soil was classified as "sandy loam" with pH of 5.6 and 0.51 percent humic matter.

Plots 10ft. x 10 ft. were established in an area with a history of green June beetle infestations and

treatments (replicated four times) were randomly assigned to the plots. All liquid insecticides were applied using a CO<sub>2</sub> backpack sprayer delivering approximately 30 gpa, operating at 40 psi.

Granular insecticide formulations were applied using a handheld Republic EZ Handscreader. All treatments except for Orthene 75S received approximately 0. inches of water immediately after application of insecticides.

All plots were oversprayed on 29 September with a 5.0 lb. ai/acre rate of Sevin 80 -S, and were evaluated on September 30 by counting all the dead grubs on the surface within two 1m<sup>2</sup> frames randomly placed in each plot. Dead grubs from the

Sevin overspray are assumed to have survived the "initial test" treatment. The average number of grubs counted per 1m<sup>2</sup> in each plot are reported in Table 1.

All data were transformed (square root of X+ 0.05) prior to ANOVA and DNMRT.

Actual means are presented in tables.

**Results and discussion**

Sampling showed treatments using Oftanol 5G provided greater control than both treatments using Orthene 75S and treatments using CGA-293343 2SC at the 10- and 20-ox. rates. Only the Oftanol and CGTA-293343 2SC at the 15-oz. rate provided a significant reduction in grubs.

**TABLE 1.**

Treatment	RATE (LB AI/A)	TARGET	—grubs per 2 m <sup>2</sup> per plot				AVERAGE
			REP 1	REP 2	REP 3	REP 4	
Orthene 75S	3.0	1 st instar	22.00	20.00	18.00	31.00	22.75 bc
Orthene 75S	5.0	1 st instar	32.00	17.00	12.00	35.00	24.00bc
CGA-293343 2SC	10 fl. oz.	1 st instar	42.00	37.00	58.00	10.00	36.76 c
CGA-293343 2SC	15 fl. oz.	1 st instar	3.00	41.00	7.00	16.00	16.75 ab
CGA-293343 2SC	20 fl. oz.	1 st instar	14.00	16.00	26.00	22.00	19.50 bc
Oftanol 5G	—	1 st instar	6.00	9.00	3.00	2.00	5.00 a
Untreated	—	1 st instar	35.00	41.00	25.00	33.00	33.50 c

Means followed by the same letter are not significantly different (DNMRT, P=0.05)