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Monobor-Chlorate + Diuron (Weed and Grass Killer)	Low	Excellent	Good	Longer	Economical, double action, for sustained annual weed control.
Ureabor	High	Excellent	Excellent	Longest	Strong control of deep-rooted perennial weeds.
Borocil IV	High	Excellent	Excellent		Use where chlorates not desired.
Hibor C	High	Excellent	Excellent		Excellent for retreatment programs.

*Single high-rate application under normal soil & rainfall conditions. Always read and follow directions on labels.

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WTT

BLACK CUTWORM CONTROL

by D. K. Pollet

As with many insects, the immature or larval stage of an insect is the most damaging. This is particularly true in the case of butterflies and moths, where the larval stage causes damage and the adult beautifies the surroundings with its presence. One particular group of moth larvae, the cutworms, cause problems and sometimes severe damage to crops, vegetable plants, and turf.

Cutworms are a serious pest in the south on grasses on the home lawn as well as the golf course. They produce multiple generations each year and can be a problem from the time the weather warms up until it frosts in the fall.

The abundance of a given species of cutworms is greatly affected from year to year by rainfall conditions which may prevent the adult moths from laying their eggs or by flooding which will force the larvae to the surface where they become food for birds or other predatory insects or animals.

The cutworm overwinters in the larval or pupal stage although a few hibernate as adults in the soil or under trash or in clumps of grass. The larval stage burrows into the soil beneath the turf and comes out to feed at night. This cutworm is cosmopolitan and has a pernicious habit of cutting off several plants while satisfying its appetite.

Their eggs are laid singly and occasionally two or three together on the blades and stems of the turf. The larva is a greasy gray to dark

Continued on page 44

Evaluation of New and Standard Materials for the Control of Black Cutworms on Bent Green Putting Surfaces¹

Turf Varieties	Seaside			Emerald							
	Count ²	Interval	Hours	0 ³	24	48	120	0	24	48	120
Treatment⁴/Rate											
Proxol 80SP 3 oz/1000 sq. ft.	5	0	0	0	6	0	0	0			
Dursban 2E 1.5 oz/1000 sq. ft.	8	0	0	0	13	0	0	0			
Velsicol 4283-4EC 1 lb ai/A	7	2	1	1	6	5	2	0			
Velsicol 4283-4EC 3 lb ai/A	3	0	0	0	11	0	0	0			
Velsicol 3883-90WP 1 lb ai/A	9	0	0	0	5	0	0	0			
Velsicol 3883-90WP 3 lb ai/A	7	1	0	1	7	0	0	0			
Diazinon 8 oz/1000	9	0	0	0	7	0	0	0			
Proxol 80SP + Tuco S8314											
3 oz/1000 + 1 pt/100	2	0	0	0	5	0	0	0			
Dursban 2E + Tuco S8314											
1.5 oz/1000 + 1 pt/100	2	0	0	0	4	0	0	0			
Orthene 75S 2.5 lb ai/A	3	1	0	0	5	2	0	0			
Orthene 75S 7.5 lb ai/A	7	1	0	0	5	0	0	0			
U.C. 51762-75WP 0.5 lb ai/A	8	0	0	0	10	0	0	0			
U.C. 51762-75WP 1.0 lb ai/A	9	0	0	0	6	0	0	0			
Dursban Plus 3 oz/1000	5	0	0	0	6	0	0	0			
Control (water only)	9	5	4	6	4	7	5	12			

¹Plots — 90 sq. ft. each

²Counts — each represents a total of 2 — 1 sq. ft. areas

³Counts made with use of Diagnostic aid 8/18/76

⁴Plots were treated with 1.5 gallons water, applied by hand — one application

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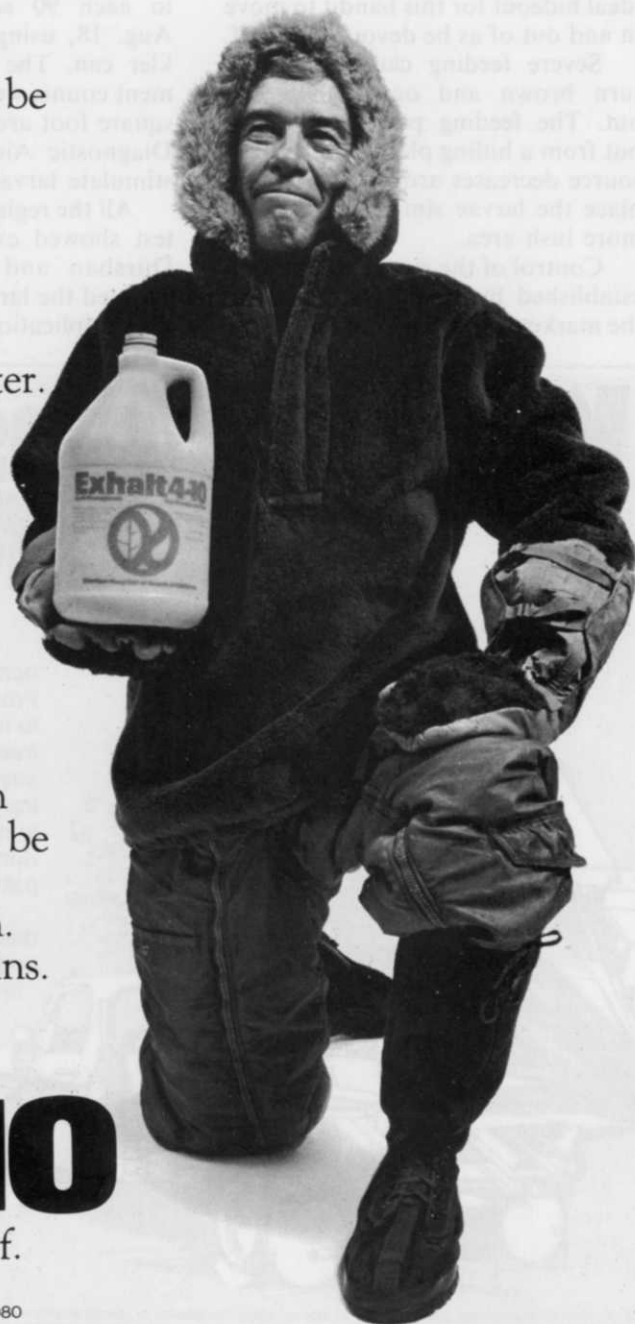
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BLACK CUTWORM CONTROL

Continued from page 42

brown and occasionally black color with faint stripes.

The black cutworm takes advantage of the cultural practice of aeration of golf greens. A course may not have a bad cutworm infestation, but as soon as the greens are aerated in come the cutworms. These little aeration holes or pockets make an ideal hideout for this bandit to move in and out of as he devours the turf.

Severe feeding causes areas to turn brown and occasionally die out. The feeding patterns radiates out from a hiding place. As the food source decreases around one hiding place the larvae simply moves to a more lush area.

Control of the cutworm has been established by several materials on the market: Dursban, Dursban Plus,

Diazinon, Proxol, Dylox and Sevin. In addition to these, new materials coming on the market show good cutworm control potential.

These tests were made on bent green varieties Seaside and Emerald at the turf plots on the Simpson Experiment Station in Clemson. A single application was made by hand to each 90 square foot plot on Aug. 18, using a 1.5 gallon sprinker can. The pre and post treatment counts were made on two one-square foot areas in each plot using Diagnostic Aid as an adjuvant to stimulate larval movement.

All the registered materials in the test showed excellent control. The Dursban and Proxol treatments agitated the larva within 15 minutes after application as they were noted

squirming on the surface. Orthene 75S and U.C. 51762-75WP showed good and consistent control of the larvae. The Velsicol materials Vel-4283-4EC and Vel-3883-90WP were a little erratic but did give good control. In no instance did any of the materials cause any phytotoxic symptoms on the plots.

Between the materials on the market and the new materials coming, cutworm control as well as other turf pest, should be no problem on the golf course or in the yard providing the applicator uses the materials properly. □

D. K. Pollet is an assistant professor of entomology with Clemson University College of Agricultural Sciences.

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From the campus

Scientist's device measures nitrogen loss

Agricultural scientists in the past reported substantial volatilization losses of nitrogen from surface-applied urea. But 1976 studies conducted by Dr. David E. Kissel of Texas A&M University, utilizing a new collection device he designed, indicate some former test conclusions may be wrong.

Experiments carried out by Dr. Kissel in 1974 and 1975, using traditional methods, confirmed earlier nitrogen volatilization loss data. Dr. Kissel, however, was not satisfied that measuring techniques were appropriate for natural field conditions. In fact, he noted that the traditional measuring equipment actually created an artificially adverse environment that greatly induced nitrogen volatilization readings.

During the winter of 1975, Dr. Kissel, working closely with Texas A&M and U.S. Department of Agriculture engineers, developed an accurate new collection device that would not create conditions of artificial temperature, relative humidity and soil water content. He believed these conditions were responsible for limiting reliability of previous data.

Then in 1976, he conducted a series of experiments on coastal bermudagrass sod using his new measuring device, which did indeed confirm his opinion that some earlier volatilization data had been incorrect.

At application rates ranging from 50 to 400 pounds of actual nitrogen per acre, Dr. Kissel was unable to measure greater than a 3 per-

cent loss of nitrogen from any treatment, and that occurred only at the 50-pound per acre application level. Losses of only one, 0.5 and one percent respectively, were measured at the 100, 200 and 400 pound application rate levels. Calcium nitrate, dry urea, Uran nitrogen solution spray and uran applied in narrow bands on the soil surface were tested. Dr. Kissel said the average of test results for two seasons indicated nitrogen uptake by the crop was "close to the same for all N sources."

"Because this conflicted with the previous data," Dr. Kissel explained, "we then recreated the experiment in the laboratory using former equipment, and found that our volatilization losses ranged as high as 39 percent."

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Meeting Dates

Mid-Atlantic Nurserymen's Trade Show, Hunt Valley Inn, Cockeysville, Md., Jan. 17-19.

Pennsylvania State University Turfgrass Conference, Keller Conference Center, University Park, Pa., Jan. 17-20.

Landscape Ontario Congress, Sheraton Centre Hotel, Toronto, Ont., Canada, Jan. 18-20.

International Florist, Growers and Nurserymen Trade Show, Civic Center, El Paso, Tex., Jan. 23-25.

Associated Landscape Contractors of America Trade Exhibit and Annual Meeting, Riviera Resort Hotel, Palm Springs, Calif., Jan. 23-28.

Colorado Nurserymen's Association and the Rocky Mountain Chapter of the International Society of Arboriculture, Colorado Nursery and Shade Tree Conference, Denver Merchandise Mart, Denver, Col., Jan. 31-Feb. 2.

International Society of Arboriculture, Midwestern Chapter Meeting, Pfister Hotel, Milwaukee, Wis., Feb. 1-3.

New England Nurserymen's Association Annual Convention, Copley-Plaza Hotel, Boston, Mass., Feb. 7-10.

American Sod Producers Association Mid-Winter Conference, Sheraton Harbor Island Hotel, San Diego, Cal., Feb. 9-11.

American Society of Consulting Arborists Annual Meeting, Don CeSar Hotel, St. Petersburg Beach, Fla., Feb. 10-12.

The Irrigation Association Annual Irrigation Conference, Salt Lake Hilton Hotel, Salt Lake City, U., Feb. 13-15.

National Arborist Association Annual Meeting, Don CeSar Hotel, St. Petersburg Beach, Fla., Feb. 13-17.

Canadian Nursery Trades Association Conference and Trade Show, Edmonton Plaza Hotel, Edmonton, Alta., Canada, Feb. 16-18.

American Institute of Landscape Architects 20th Annual Convention, South Coast Plaza Hotel, Costa Mesa, Cal., Feb. 17-19.

National Landscape Association and Garden Centers of America Joint Management Clinic, The Galt House, Louisville, Ky., Feb. 20-23.

American Society of Golf Course Architects 31st Annual Meeting, Hilton Head, S.C., Feb. 20-25

Midwest Regional Turf Conference, Purdue University, West Lafayette, Ind., Feb. 28-Mar. 2.

Canadian Golf Superintendents Association 28th Annual Turfgrass Show, Calgary Inn, Calgary, Alberta, Canada, Mar. 14-16.

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People on the Move

Gary Holland has been named general manager of the Whirl Trim division of **The Toro Co.** He will be headquartered in Eden Prairie, Minn. Holland graduated from the University of Missouri as a mechanical engineer. He also holds an M.B.A. from Purdue University.

Doyle C. Jones has been elected president of the **Florida Turfgrass Association.** A landscape superintendent at Walt Disney World, Jones has served as director, secretary-treasurer and vice president.



Doyle Jones

He will serve a one-year term as president.

Randy F. James has joined the Chemagro agricultural division of **Mobay Chemical Corp.** as a sales representative. He received a B.S. from the University of South Dakota.

Joseph Gent has been promoted to branch manager of the Minneapolis distribution center of the **Thompson-Hayward Chemical Co.** In his new position, Gent will be responsible for the sale and administration of

the company's line of agricultural, industrial and textile supplies.

Thomas W. Dlugos has been promoted to northern regional sales manager of the agricultural business group of **Velsicol Chemical Corp.** He received his B.S. in biology/conservation from Wisconsin State University.

Ronald S. Leafblad has been named president and general manager of **Ag-Chem Equipment Co., Inc.** Leafblad's experience includes his most recent position with Toro as group vice-president-outdoor equipment group. Previously he served as division president and vice president of marketing for White Motor Corp.

Joining the agricultural division of **Ciba-Geigy Corp.** as field sales representative in northwest Missouri is **Dennis Gray.** Gray was a district sales manager with Columbiana Seed Co. He holds a B.S. in agricultural mechanization from the University of Missouri.

John Stark has been appointed marketing manager of the outdoor power equipment division of **J I Case Co.** Stark, who attended the University of Wisconsin, was formerly a materials manager for that division.

Gary Custis, Dick Evenson and **Gregg Deegan** have been named technical representatives for the ProTurf division of **O. M. Scott and Sons.**

Custis recently earned a master's in agronomy from Virginia Polytechnic Institute and State University. Evenson comes to ProTurf after 25 years in the Air Force. A member of the Air Force Golf

Course Council, he most recently supervised the golf course at Dover AFB, Del. Deegan is a former golf course superintendent.



Dick Evenson

Bob Miller has joined **Lakeshore Equipment & Supply Co.** as eastern manager for the company's LESCO line. A Clemson University graduate, Miller is a specialist in agronomic fertilizer and turfgrass management.

Robert DeCicco has been promoted to marketing manager for the agricultural chemical division of **Thompson-Hayward Chemical Co.** In his new capacity, DeCicco will plan and coordinate the overall marketing plan for proprietary agricultural chemicals.

Diamond Shamrock Corp. has named **Charles E. Osgood** as commercial development technical representative for the northwest territory. Osgood will be responsible for coordinating university, state and inhouse field development activities for the company's agricultural chemical products in the northwest. He holds a B.S. in Entomology from the University of Maryland and is working toward a master's in entomology at Oregon State University.