CHLORDANE—WHAT ARE THE ALTERNATIVES?

by Ron Morris

Environmental Protection Agency hearings on the chlordane issue are still rolling on, but all indicators point toward turf insect control without chlordane by sometime this fall.

"It (chlordane) probably won't go completely out of the picture," in the opinion of one EPA official, but will definitely be out for use on turf. The reason is potential human exposure. Chlordane will probably remain in use as a subterranean termite control because of its long persistence in the soil and, most likely, farmers will be allowed limited use provided applicators protect themselves with proper clothing.

In the past, when other chlorinated hydrocarbon insecticides were banned, substitutes came to light. For example, when aldrin, dieldrin and heptachlor were banned, chlordane came into use. Now chlordane is going and a substitute must be used.

Existing organophosphate insecticides, such as diazinon, chlorpyrifos (Dursban), and trichlorfon (Dylox or Proxol) can provide the answer if applied properly. Since organophosphates are not persistent, they need to be moved from the surface into the soil immediately to be effective.

"Thatch is a major factor limiting the effectiveness of insecticides in controlling soil inhabiting insect pests of turf," according to Dr. Harry Niemczyk, professor of turfgrass entomology at the Ohio Agricultural Research and Development Center.

Currently available organophosphate insecticides do not move freely through thatch, so it becomes an urgent necessity to move them. If rainfall doesn't do it, then irrigation is called for.

Experiments in Ohio have shown that one-half inch of thatch in turf can significantly reduce the effectiveness of the organophosphate insecticides.

Liquid diazinon, giving 90 percent or better control at 5.5 to 6 pounds AR/A (active ingredient per acre), was reduced to 52 to 60 per-

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cent effectiveness by one-half inch of
thatch. Granular diazinon, giving 90
percent or better control also, was
reduced to 69 to 74 percent control.
Dursban at two and four pounds
A1/A, controlling an average of 69
to 74 percent, respectively, was
reduced to 21 and 26 percent con-
trol, respectively.

Experiments at the Ohio Agri-
cultural Research and Development
Center in Wooster, Ohio, concluded
the reason was that the insecticides
were becoming bound to the thatch
and were simply not reaching the
soil, the target area.

Chlorpyrifos was the most
readily bound. Trichlorfon has a
lesser tendency to bind, but results
from it have been varied, according
to Dr. Niemczyk. The reason for
this variability is not known and
must be better understood to ensure
future control of soil-inhabiting
insects.

Two experimental insecticides,
CGA-12223, a product of CIBA-
GEIGY, and bendiocarb, a product
of Fisons, have shown to be effective
against grubs and are not prone to
absorption by thatch.

CGA-12223, an organophos-
phate, has shown good activity
against a broad spectrum of soil in-
sect pests in corn, vegetable crops
and turf. Broadcast at rates of one-
half to two pounds A1/A, it has
demonstrated effective control of
Japanese beetle, European chafer,
Southern masked chafer, June
beetles, chinch bugs, sod web-
worms and mole crickets. Turf
tolerance has been excellent with
eight pounds A1/A showing no
damage to a cross section of
northern and southern turf species.
It is being tested further for control
of nuisance lawn pests such as ants
and clover mites.

CIBA-GEIGY currently holds a
one-year experimental permit from
the Environmental Protection
Agency for CGA-12223 and is plan-
ing to renew it for another year.
They expect to submit a full label re-
quest soon.

The company is working with 2E
and 5G formulations for com-
mercial turf usage.

The 2E formulation contains
two pounds A1/gallon. It is recom-
ended for chinch bugs, cutworms,
mole crickets, sod webworms and
white grubs (dung beetle, European
chafer, Japanese beetle, June beetle,
Southern masked chafer) at the rate
of two to four quarts per acre in a
minimum of 25 gallons of water
per acre. It is further recommended
for grubs and mole crickets that the
turf be thoroughly irrigated after
application. For other insects, light
watering is sufficient.

Five to seven gallons of the 2E
formulation per acre in a minimum
of 25 gallons of water will control
cyst, ring, spiral, sting, stubby root
and stunt nematodes.

CGA-12223 5G, a granular
formulation containing 5 percent A1
controls insects at the rate of 20 to
40 pounds per acre and nematodes
at 200 to 300 pounds per acre.
Watering is recommended for mov-
ing the formulation directly to the
soil.

Fisons' NC 6897 experimental
insecticide currently has EPA regi-
stration under the trade name
FICAM for pest control operator
use. Garvox is the proposed trade
name for agricultural use and
bendiocarb is the proposed common
name.

NC 6897 is a carbamate com-
pound and has been effective in con-
trolling both larval and adult stages
of May and June beetles, Japanese
beetles, dung beetles and controls
chinch bugs and sod webworms.
There has been limited evidence to
suggest that NC 6897 will also con-
trol billbugs, armyworms, cut-
worms and mole crickets. It is effec-
tive against many nuisance pests in-
cluding ants, crickets, fleas, ticks,
wasps and sowbugs.

NC 6897 is being tested against
sub-soil pests in granular and wet-
table powder formulations at rates
of one to four pounds A1/A.
Thorough irrigation after applica-
tion is recommended. It is being
tested against surface feeders at
rates of one-half to two pounds
A1/A.

Fisons plans to take data from
its experimental program this year
and submit for registration some-
time in late '78, hopefully in time for
marketing in late 1979.