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Compact soil sampling strategy for white grubs

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Annual white grubs (WG) are early-season pests attacking corn seeds and seedlings (Figure 1). Heavy WG infestations can cause stand and yield losses of up to 20%. Because grubs occur in the soil, their presence in fields and subsequent damage to corn may go unnoticed until too late. Also, 30% overwintering mortality in WG densities is typical in VA. Insecticidal seed treatments such as clothianidin (Poncho™) and thiamethoxam (Cruiser™) are the tools of choice for controlling soil insect pests. Growers typically must decide whether to purchase insecticide-treated seed well in advance of spring planting.

Japanese beetle Asiatic garden beetle Masked chafer

Figure 1. White grubs commonly found in Virginia corn fields.

The compact method (CM) is a fall sampling strategy for WG that provides timely and useful information for pest management decision-making. The CM is based on an 8-inch square by 6-inch deep volume of soil that is hand sifted for WG on a tarp placed on the ground next to the sample site (Figure 2). **The CM is as accurate as the traditional 12-inch square standard method, but is about 57% faster, with much lower sampler fatigue.**

Compact Standard Compact Standard

Figure 2. Comparison of sampling grids, hole size, and soil volume using compact (8-inch) vs. standard (12-inch) method.

Action threshold (AT)* for fall sampling and for spring sampling using the compact method:
Fall AT: 1.6 white grubs per 8-inch square sampling grid.
Spring AT: 1.04 white grubs per 8-inch square sampling grid.

Minimum number of compact method samples and time needed per field to be 95 percent confident your sample average is within the specified percentage of the actual field mean:

25%: 3 to 4 samples per field (10-15 minutes)
20%: 5 to 6 samples per field (20-25 minutes)
15%: 10 samples per field (30-40 minutes)
10%: 22 samples per field (about 1.5 hours)

Definitions:

Action threshold*

Levels of pest populations at which control should be implemented to avoid significant damage to the crop. (Fasulo, T. R. 1995. WHITEFLY Hypertext Knowledgebase. (http://entnemdept.ufl.edu/fasulo/whiteflies/wfly004b.htm)).

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