Black Cutworm IPM: Are We There Yet?

IPM Integrated Pest Management

IPM Corner

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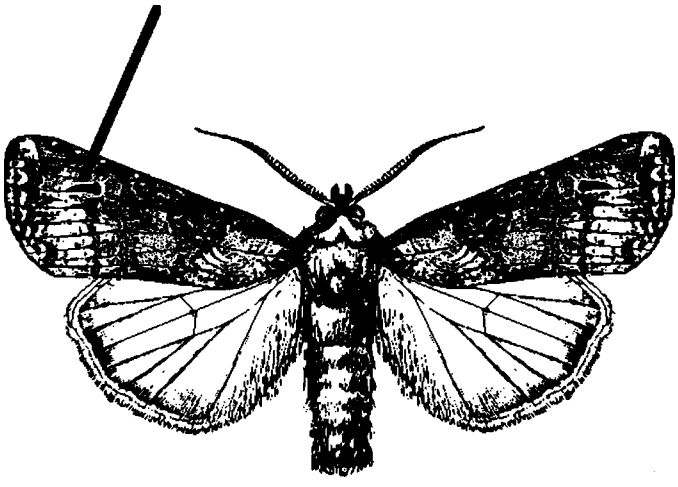
A major feature of any true IPM Program is the continual refinement that comes through reviewing our successes and failures. Golf Course Turf IPM has made great strides over the past decade and most major insect pests are far along the continuum, yet management of some pests remains far from "ideal". Such a pest is the black cutworm.

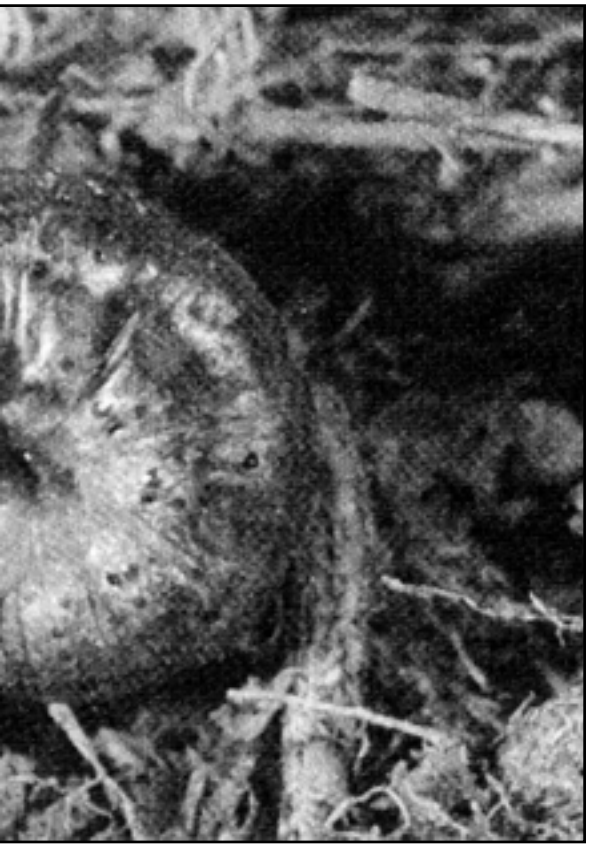
The Beast

In the U.S., the black cutworm, *Agrotis ipsilon*, overwinters well below the Mason-Dixon Line as pupae. Northern areas are recolonized during the growing season by adult moths carried along storm fronts. Some suspect it may manage to survive farther north during mild winters but this has not been substantiated in New York. They either land upon encountering colder air or precipitate out with heavy rains so can appear unexpectedly many miles from their origin. Once they recover from their flight, female moths lay their eggs, usually on blade tips, and larvae hatch in 3-6 days. They go through as many as 7 molts or instars in 3-5 weeks before pupating below ground. The larvae are active at night, burrowing into the thatch and soil to wait out the day. They feed on blades when young and stems when older, cutting off plants and dragging them into the burrow. This late feeding is the point where damage becomes visually obvious on greens.

Adult Monitoring

The initial appearance of adults in the north can be monitored using either pheromone traps or black light traps, set out early in the season (mid-March in southeastern New York), but both have their shortcomings. Black light traps are expensive, high maintenance and labor intensive but have the advantage of capturing both male and female moths (along with a wide variety of other insects). Pheromone traps are relatively inexpensive and simple to maintain but catch only male moths. The random deposition of storm-driven moths means there is no guarantee that zero captures means zero females nor any way to equate capture numbers to infestation levels, thus their usefulness is limited. A positive capture only means that chances are good that





females are also around and you may have larvae within a week. In agronomic crops, primarily corn, it is recommended that scouting for the damaging 4th instar should begin 168-300 GDD after first capture. On greens, damage would be readily noticeable by the time they reached 4th instar so the management decision should ideally be made prior to their reaching that stage.

Larval Monitoring

The standard method for monitoring larvae is the soapy water drench: 1 fluid ounce lemon-scented dish detergent per 2 gallons water applied to 2-3 sq ft of green and anywhere from 1-3 samples taken per green. The soap acts as an irritant, causing the larvae to emerge from hiding. The reliability of detecting young larvae by randomly sampling only two to six square feet of each green is questionable, particularly as young larvae are prone to falling back into their holes before being noticed. In addition it can be both time and labor intensive. Our experience has been that the soapy drench works best to confirm the presence of cutworm where suspect damage is already apparent. While this helps prevent misdiagnosis and a potential misapplication (cutworm damage superficially resembles dollar spot or ball marks) it doesn't serve the other goals of monitoring.

Management

Cultural recommendations include dumping clippings at 50 - 200 feet from greens to prevent newly hatched larvae from migrating back onto the green. Neither endophytic perennial ryes nor tall fescues are resistant however they shun feeding on Kentucky bluegrasses so a buffer of Kentucky bluegrass around a green may reduce the incidence of feeding (Chris Williamson, personal communication).

Of the bio-logicals, *Beauveria bassiana* reportedly has little effect and nematode results are inconsistent. This inconsistency is largely due to the added requirements nematode applications need to insure successful treatment. Closer attention must be paid to product viability and environmental conditions at the point of application. Timing to the appropriate life stage, in this case early instars, of the pest is critical. Our inability to consistently detect young larvae prior to damage not only hampers the effective use of nematodes, it precludes making an infes-

Black cutworm eggs cling to the tips of grass blades.

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Black Cutworm

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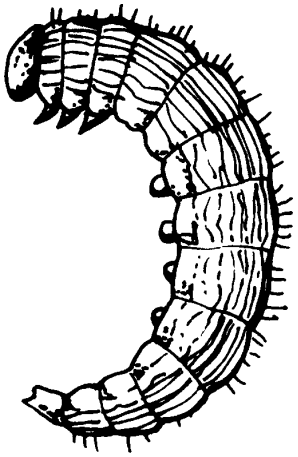
Cultural management options are limited and of unknown impact, biological options are also few and more difficult to utilize effectively, traditional chemical options will likely decline, and greater reliance will be placed on newer materials that require proper timing.



tation level decision based on an as yet to be determined threshold. As successive storm fronts may bring in waves of adults there is often a wide range of larval sizes present at any one time, further complicating the use of products targeted to specific life stages.

Traditional chemical materials registered in New York include; carbaryl (Sevin), acephate (Orthene), chlorpyrifos (Dursban), trichlorfon (Dylox, Proxal) along with the restricted use material, ethoprop (Mocap). As many of these are subject to FQPA their future availability is unknown. Newer materials available include halofenozide (Mach2) and spinosyn (Conserve) and may be preferable because of their lower mammalian toxicity. However, like nematodes, timing is an issue as they are most effective against early instars. Blanket applications applied 1 – 2 weeks after pheromone or black light capture may prevent noticeable damage from occurring but mean making applications blindly, without respect to need (both uninfested and infested greens being treated equally). Unfortunately, the "working threshold" we're often forced to use is: "See damage, confirm cutworm, treat for cutworm." While this may mean using less material than blanket applications, it restricts us to using products effective against the larger, later instars. The benefits of treating at that point is dubious as 1) damage has already occurred, 2) larvae may be nearly finished feeding so little damage is prevented unless several larval stages are present, 3) the population level of following generations may be reduced but is subject to infestation by later waves of migrating adults, thus the need for future treatments may be unaffected.

So Where Do We Stand?

The current options for monitoring either adults or larvae are unreliable for confirming presence or absence, inaccurate for proper timing of stage critical management options and inadequate to predict either treatment need or precise location. Cultural management options are limited and of unknown impact, biological options are also few and more difficult to utilize effectively, traditional chemical options will likely decline and greater reliance will be placed on the newer materials — materials requiring proper timing.

Where Do We Go From Here?

While the bulk of cutworm research is targeted to their role as pests of corn and other vegetables much of that information will, hopefully, be useful to turf situations as well. We've got a long ways to go with this pest and, with a fair number of other turf pests higher in priority due to their greater impact, it won't happen overnight. However, there are a number of research projects directed towards cutworm on turf, often in partnership with cooperating superintendents, so progress can be expected. We may not see the light but we are partly through the tunnel and headed in the right direction.

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