As we entered this growing season, many questions remained regarding the fate of the western corn rootworm population throughout Illinois. The past two years, corn rootworm larval injury and adult numbers have been very low. Explanations included saturated soils during larval hatch (late May and early June), extensive use of Bt hybrids, and commonly applied broadcast treatments (to corn and soybean fields) of tank-mixed fungicides and insecticides.

The third week of June, Joe Spencer, an entomologist with the Illinois Natural History Survey, reported some significant root pruning on plants in plots just north of Urbana. On July 5, Mike Vose, with the Orr Research and Education Center in Perry, noted having observed more western corn rootworm beetles in the trap crop (late-planted corn) than he saw during the entire season last year.

On July 11, Ron Estes, senior research specialist in the Department of Crop Sciences, and our summer research crew began to evaluate plots near Urbana for corn rootworm injury. Ron described the feeding as more significant than last year, with injury on some check (control) roots significant—several nodes of roots pruned. He noted that root injury at the Orr and Monmouth Research and Education Centers may be low to moderate despite more adults in the trap crop. Nick Tinsley, a Ph.D. student and visiting research specialist in agriculture in the Department of Crop Sciences, photographed the western corn rootworm adults that had emerged into a 10-by-10-ft walk-in tent near Urbana over 3 days late last week (July 8–11). This level of emergence far exceeds that observed last year during a comparable sampling period for this experiment.

Over the next few weeks we will continue to dig, wash, and evaluate roots in our plots located near DeKalb, Monmouth, Perry, and Urbana. I’ll share the preliminary rating results in later issues of the Bulletin. It is my hope that we can also conduct some western corn rootworm adult surveys around the state this summer and share those numbers during fall and winter University of Illinois Extension meetings. If you observe significant levels of root injury this summer, please share your observations with me. Thanks.—Mike Gray
Western bean cutworms. Our trapping cooperators in Illinois (pmn.ipm.illinois.edu/insects.php?year=2011) have not reported significant captures of western bean cutworm moths. Entomologists at Purdue University also have reported that the number of moths caught in pheromone traps is well below 2010 levels so far this season (extension.entm.purdue.edu/pestcrop/2011/issue13). It may still be worth monitoring fields for western bean cutworms, especially if a non-Bt hybrid has been planted. For details on the life cycle, biology, and management of this insect, see ipm.illinois.edu/fieldcrops/insects/western.bean_cutworm. —Mike Gray

Plant Diseases

Goss’s Wilt of Corn

A few observations of Goss’s wilt of corn, caused by the bacterium Clavibacter michiganense subspecies nebraskensis, have been reported in Illinois. Corn fields that have been subjected to hail, high winds, and/or heavy rainfall are most likely to be affected by Goss’s wilt. Symptoms are large tan to gray lesions on the leaves, with dark spots, often referred to as fleckles, within the lesions. Edges of lesions may appear “water-soaked,” and bacterial exudates (ooze) may be visible on the surface of affected leaf areas (photos on page 95). If the bacterium enters the plant xylem, wilting may occur. In some cases, the vascular tissue may be darkened in affected plants if a cross-section is cut through the stalk.

Symptoms of Goss’s wilt may be confused with other foliar diseases, including Stewart’s wilt, northern leaf blight, and Diplodia leaf streak. Proper identification is important, so suspicious samples should be sent to the University of Illinois Plant Clinic (web.extension.illinois.edu/plantclinic). No in-season control options are available to protect against Goss’s wilt or to reduce the spread of disease within a field. Foliar fungicides are not effective in controlling Goss’s wilt because it is caused by a bacterial pathogen rather than a fungal one. The primary management method is planting corn hybrids with higher levels of resistance (check with your...
Crop Development

Wind Damage in Corn

The past two weeks have brought a number of incidents of wind damage to corn in Illinois. The two major forms of damage reported have been green snap, in which corn stalks break at a node, and root lodging, in which plants lean at different angles, up to nearly flat on the ground, as the roots pull part way out of the soil. Stalk lodging, in which stalks kink over at an internode, is typically found only later in the season, after stalks have strengthened and plants are carrying the weight of ears.

Green snap is not a rare phenomenon, but it affects relatively few acres in most years. It occurs unpredictably: it’s not uncommon, for example, to find fields with the same hybrid planted a few days apart showing different levels of green snap. Some hybrids tend to be more susceptible than others, but nearly every hybrid could show some of this damage if winds are high enough at the vulnerable stage.

Green snap occurs at nodes, but the node of breakage can range from just above ground level—the fifth or sixth node up from the base—to at or even above the ear. The break point is set by a combination of how much growth there is above each node, leaves that catch the wind, and how brittle each node is. When stalks elongate rapidly like they did this year, they tend to be more vulnerable to breakage. Herbicides like dicamba can also contribute. In general, the faster the growth, the more susceptible plants are to green snap.

Yield effects of green snap depend on the number of plants snapped and where the breakage takes place. Stalks that break above the ear will usually produce an ear, but if nearby plants are intact, they will shade the broken-off plants and reduce ear size. When plants break at the node below the top ear, dormancy will break and allow the next ear down to develop, but it may not receive enough pollen to produce a lot of kernels. Plants that break near the ground won’t produce yield, of course, but will allow more light to reach intact plants, which in turn will produce more grain. Loss of plants thus typically reduces overall yield less than the percentage of broken plants might suggest.

Though you might be able to find hybrids that seldom or never show green snap, the problem is rare enough in Illinois that you probably should not sacrifice any yield potential to gain this protection. I would note that lowering the plant population, which allows individual plants to grow a little faster and so show brittleness at certain stages, does little or nothing to reduce green snap. Crop insurance is probably the best way to prevent catastrophic losses from this problem.

“Flattening” of corn fields by winds at high velocity that push plants over is visually very distressing; people often talk about fields being “steamrolled” or “less than a foot high.” This phenomenon is somewhat more complex than green snap, and its effects are more difficult to predict. It’s obvious that plants with
stalks strong enough to resist breakage might be pushed over instead. It’s also possible that plants with root systems that aren’t quite large enough, deep enough, or anchored well enough in the soil tend to root-lodge before they have a chance to green-snap.

The major types of injury suffered by “leaning” plants are disruption of the root system and disorientation of the leaves. Root systems often lose more than half of their contact with the soil, and this immediately reduces the ability to take up water and nutrients. Having some of the leaf area underneath the plants, and in extreme cases down against the ground, reduces the amount of sunlight these leaves can take in. Coming at a time when plants need maximum photosynthetic rates to assure successful pollination, this is a real negative. One positive is that this slows the rate of water uptake, which may help roots to reestablish soil contact, both by soil settling (with rainfall) around the roots, and by some new root growth.

The closer to pollination this happens, the less chance plants have to regrow roots, but this ability doesn’t go away until several weeks past pollination.

One key to recovery of root-lodged plants is the degree to which the lower stalk can turn back upward, bending so that leaves can be reoriented to better intercept sunlight. The later in growth that lodging happens, the less flexibility stalks have to do this, and the higher up the stem this flexibility exists. Such plants end up “goose-necked,” but that by itself doesn’t cause a lot of harm if the leaves can intercept sunlight and the roots can recover well enough.

Research in which plants were artificially root-lodged at different times and to different degrees has generally shown some yield loss, but not as great as the appearance of the crop immediately after the event might suggest. Anecdotally, most cases of root-lodging before pollination that I’ve seen have usually ended up causing less yield loss than expected. If it stays dry where this has happened or if leaves don’t continue to function well, however, yield losses can be substantial.—Emerson Nafziger