LATE SEASON SCOUTING TO PLAN FOR HARVEST AND NEXT SEASON

- Late season scouting of corn can help assess the season in preparation for harvest and planning for next season.
- Issues that occurred during the growing season can be identified and management strategies can be developed to help minimize any issues going forward.

Stalk and Ear Issues

Insects[1,2,3]

Depending on geography, there are a handful of caterpillars that can be found attacking the ear or stalk during late season scouting. The European corn borer (Figure 1a) and the southwestern corn borer (Figure 1b) can be found feeding within the ear shank, stalk, or ear and occasionally on kernels. The western bean cutworm (Figure 1c), corn earworm (Figure 1d), and fall armyworm (Figure 1e) are found almost exclusively feeding on the ear. The usual feeding location of the corn earworm is at the ear tip, and occasionally larvae can be found at the ear butt. The corn earworm color can be extremely varied ranging from green to almost black. The larvae are cannibalistic, so usually no more than one is found per ear. The diagnostic character for this species is the tan colored head.

The western bean cutworm is often found feeding at tip as well, but the larvae bore into the ear at any location along the ear. There can be multiple larvae on each ear.

The diagnostic character for this species is the two black to dark brown bars behind the head. The fall armyworm also bores into the husk at any location along the ear but will feed along the side of the ear consuming the kernels. The diagnostic character for this species is the inverted white Y between the eyes with a black or dark brown head capsule.

Other Late Season Ear Feeding Insects

Stink bugs and picnic beetles can also be found feeding on corn late season. Stink bug injury to kernels causes a scarring or bruising appearance on the kernels. Injury is typically found at the ear tip. Picnic beetles are often found feeding on fermenting kernels that have been injured by other insects or birds.

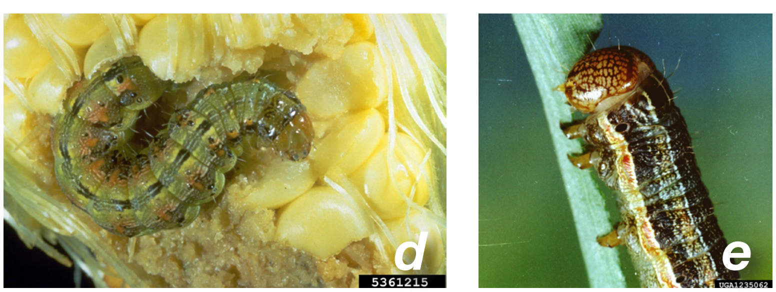

Figure 1. (a) European corn borer, (b) southwestern corn borer, (c) western bean cutworm (Images courtesy of Frank Peairs, Colorado State University, Bugwood.org), (d) corn earworm (R.L. Croissant, Bugwood.org), (e) fall armyworm (Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org).

LATE SEASON SCOUTING TO PLAN FOR HARVEST AND NEXT SEASON

Stalk and Ear Rots[4,5]

There are several stalk and ear rots that can occur. Stalk rots are frequently favored by good to excellent growing conditions early in the season that encourage maximum kernel set and development followed by stress during grain fill. Carbohydrate remobilization, unbalanced soil nutrients, compaction, and lack of sunny days are some stress factors that may predispose the plant to infection by stalk rots. Common stalk rots include: Anthracnose (Figure 2a), Diplodia, Fusarium, Gibberella (Figure 2b), and charcoal rot.

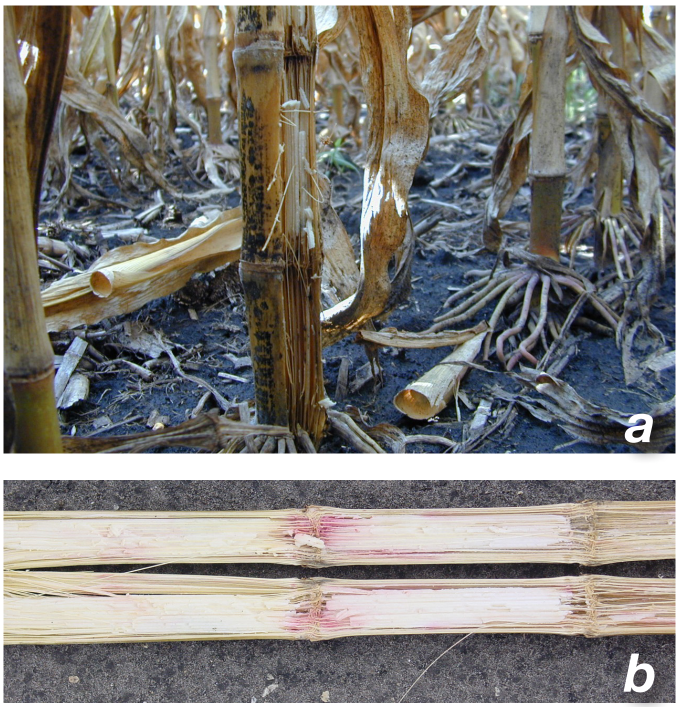

Figure 2. (a) Anthracnose stalk rot and (b) Gibberella stalk rot.

Scouting during late season grain fill can help prioritize fields for harvest and identify possible management tactics to help reduce the incidence for the following year. The pinch or push test can be used to evaluate stalk strength and provide an indication of possible plant lodging by randomly assessing at least 100 plants per field.

- Pinch plants at one of the lower internodes above the brace roots. If the stalk collapses easily, then it is more prone to lodging.
- Push plants to around a 30-degree angle. If they fail to snap back, stalks are compromised and at a higher risk for lodging.

Some of the same pathogens that cause stalk rots can also cause ear rots, but ear infections usually result from weather conditions rather than management or additional stress factors. Common corn ear rots include Aspergillus, Fusarium, Gibberella, Diplodia, and Penicillium ear rot. Aspergillus ear rot (Figure 3a) symptoms include olive green or yellow-tan fungal growth on and between kernels. Diplodia ear rot (Figure 3b) symptoms include bleached husks, white mold over kernels beginning at the base, and rotted ears with tightly adhering husks. Small, black fungal bodies called pycnidia are often found on husks, kernels, and cob tissues. Typical symptoms of Fusarium ear rot include scattered individual kernels or groups of kernels with whitish-pink to lavender fungal growth. Gibberella ear rot (Figure 3c) symptoms include reddish kernel discoloration, usually beginning at the ear tip. Penicillium ear rot infection typically starts at the ear tip and on ears with mechanical or insect damage. Powdery green to blue-green mold develops on and between kernels. Infected kernels may become bleached and streaked.

Figure 3. (a) Aspergillus ear rot, (b) Diplodia ear rot, (c) Gibberella ear rot.

Mycotoxins can be produced by Aspergillus, Fusarium and Gibberella pathogens, so proper identification is important so harvest management, grain handling, and storage can be used to minimize the impact. If you are unsure as to the type of ear rot, the local extension service office should be able to provide a list of laboratories that can confirm the presence of the pathogen.

LATE SEASON SCOUTING TO PLAN FOR HARVEST AND NEXT SEASON

Malformed Ears

Occasionally while scouting corn late in the season, unusual shaped or malformed ears will be found. Environmental, insect, and chemical stress during the vegetative and early reproductive stages (V5 to R3) of corn can cause abnormal or malformed ears. Distinctly different symptoms develop depending on the timing, type, and severity of the stress. Pesticide applications can be a source of stress on corn if the application occurs outside of product label conditions or other stresses increase corn susceptibility.

Weeds4

Late-season scouting is an excellent way to assess the weed management plan. It can verify weed escapes, new weed species, and distribution of weeds within the field. With this knowledge the weed management plan for the following cropping season can be adjusted to respond to the weed situation.

- Identifying weed species and the extent and distribution of weed infestations in a field can help with herbicide selection and application timing to keep tough-to-control weeds in check next season.
- Weeds with late season germination and survival and/or prolific seed production, may require multiple herbicide modes of action and sequential applications.
- Weeds present at harvest may indicate that a postemergence (POST) herbicide application that includes a residual may need to be part of the weed management plan.
- The POST herbicide program may need a different mix of herbicide modes of action to cope with the weed spectrum.
- A pre-emergence (PRE) herbicide program alone may not provide the diversity and longevity of herbicide action necessary to manage the weed situation without a sequential POST application.

Nutrients6

The most common nutrient deficiencies observed late season are nitrogen and potassium. Both nutrients are mobile in the plant and are translocated to newer growth. Nitrogen deficiency symptoms appear on leaves as a V-shaped yellowing, starting at the tip and progressing down the midrib toward the leaf base (Figure 4). When deficient, nitrogen can be translocated from the stalk to the developing kernels, resulting in weak stalks and predisposes the stalk to infection by stalk rot pathogens. Potassium deficient plants exhibit a yellowing and necrosis along the margins of the leaf on older leaves but may not exhibit symptoms on newer growth (Figure 5). Potassium deficient plants are also predisposed to lodging as potassium plays a role in maintaining stalk integrity.

Figure 4. Nitrogen deficiency in corn. Photo is provided courtesy of the International Plant Nutrition Institute (IPNI) and its IPNI Crop Nutrient Deficiency Image Collection, C.Witt, J.M. Pasuquin.

Figure 5. Potassium deficiency in corn.

LATE SEASON SCOUTING TO PLAN FOR HARVEST AND NEXT SEASON

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