



Crop Production

Check root development in corn fields

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Mesocotyl rot is occurring in corn seedlings at some locations in Iowa. Alison Robertson addressed this in “Corn seedling health and stand establishment” on page 131 of this issue. Is this important once the corn has emerged and with the warm temperatures we are now receiving?

Proper root development during these next few weeks is critical to the success of the crop. Corn has two root systems that are easily visible early in the year. The initial root system, the seminal roots, is comprised of the radicle and lateral seminal roots. The seminal roots help anchor the young seedling and provide it with nutrients and water.

The shoot is comprised of the mesocotyl and coleoptile. The second root system, the nodal roots, develops at the base of the coleoptile. The location of the nodal roots is typically the same unless the seed was planted extremely shallow. They should form approximately 1–1.5 inches below the soil surface. The mesocotyl connects the kernel and the coleoptile. The mesocotyl length will vary depending on seeding depth (see figure).

Seminal roots cease new growth shortly after the coleoptile emerges from the soil surface. Once the plant is approximately V1, the nodal root system is visible. The corn in the picture is in between V1 and V2, and the initial development of the nodal roots is visible. The nodal root system becomes the dominant system by V6.

Most corn in Iowa has or will very soon develop its nodal root system. A healthy mesocotyl is extremely important since it transports nutrients from the kernel to the developing seedling. The plant primarily depends on the kernel's contents for its nutrients and energy until the nodal roots are developed. Therefore, it is possible that seedlings may be stunted or die if their nodal roots do not develop before the kernel reserves are exhausted. This is an important time to check your fields for root development to determine if seedlings are healthy.

Also see “Root development is key to corn's success,” by Bob Nielsen, extension corn specialist, Purdue University, at www.agry.purdue.edu/ext/corn/news/articles.03/RootDev-0528.html.



Mesocotyl and coleoptile development across different seeding depths. Seeding depth on the left is approximately 3" progressing to ½" on the right. Picture taken at the Armstrong Research and Demonstration Farm on May 16, 2006. (Lori Abendroth)

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