



PAIN IN THE ROOT: Roots should suggest a wagon-wheel effect, rather than a "hatchet," as this example illustrates. The likely culprit: too much down pressure.



CHOP AWAY: Get a closer and more accurate look at corn root systems by cleaning off dirt and cutting back brace roots. A small hatchet works well. In this example, roots form a more desirable wagon-wheel effect.



Avoid root mistakes

By HOLLY SPANGLER

WHAT'S the best plan for growing healthy corn roots? "Anything that gets the root system up and moving as quickly as possible," says Extension county director Matt Montgomery, suggesting an ounce of prevention may, indeed, be worth a pound of cure.

It's no secret that root systems, though buried out of sight, contribute mightily to the health of corn plants. Healthy roots deliver nutrients, draw

Key Points

- Get root systems up and moving as quickly as possible.
- Cut compaction with correct down pressure.
- Dig roots throughout the season to find malformations.

moisture and, more noticeably, hold the plant upright — a big deal to any Illinois farmer who's ever harvested downed corn. Yet from planting through late-season, everything from compaction to insects threatens

the healthy development of those roots.

So what can you do to prevent problems? Here, experts offer their best answers:

Cut out sidewall compaction.

During planting, down pressure can have a tremendous affect on early root development, says Dustin Blunier, with Precision Planting in Tremont. Roots naturally want to come out of the seed at a 35-degree angle, then head downward. Too much down pressure

compacts the trench, forcing air out and sending roots straight down before they can spread out. The plant becomes stressed and is vulnerable to pests. The situation also creates "hatchet" roots, which don't take up nutrients as well and lead to spindly plants and reduced yield.

Blunier says farmer test plots showed as much as a 20- to 30-bushel difference in yield between planting with correct down pressure and planting with pressure cranked down as much as possible.

"Correct down pressure should simply maintain the depth at which you're wanting to plant," explains Blunier.

Rate your plants

ALTHOUGH many producers will identify root damage by aboveground observation ("Hey, there's a lodged plant!"), it can be helpful to apply an injury rating system when digging up those roots. As Extension county

director Matt Montgomery suggests, assigning values to root damage can give you a better picture of what you may have missed in 2008, and help you better prepare for problems in '09.

Three years ago, Iowa State

University entomologists developed a simplified version of their previous root rating system, which has become the accepted system for evaluating root injury across the Midwest.

For an interactive look at this root injury scale, see below or check out www.ent.iastate.edu/pest/rootworm.

Evaluate corn roots with university's system

Rating	Visual Description	What it looks like
0.00	No feeding damage; lowest rating that can be given	
1.00	One node, or circle of roots, eaten back to within about 1½ inches of the stalk	
2.00	Two complete nodes eaten	
3.00	Three or more nodes eaten; highest rating that can be given	

NODE INJURY: On this scale, damage in between nodes is indicated after the decimal. For example, say rootworms have eaten a node and a half of roots, the rating would be 1.50. One-fourth of a node eaten would equal a rating of 0.25. SOURCE: IOWA STATE UNIVERSITY.

Check planting conditions.

Don't do anything to slow the plant's development or give it a weakness, allowing insects a foothold, Montgomery says. Use a penetrometer preplant to check for hardpan and compaction. Don't plant into too-cool soils, which stagnates development. Watch knife positions if you sidedress so you won't burn roots with nitrogen.

Consider putting your best early-season vigor hybrids into fields that historically face stressful situations.

"When you think about insects like grape colaspis or wireworms or grubs, part of the secret is to get the plant moving along," Montgomery adds. "If you have good early-season vigor, you might stay ahead of the curve."

Create consistent soils.

Blunier likes to create consist-

tent soil density with vertical tillage, which lets roots work in the same amount of compaction throughout the profile. "If you plant into fluffy dirt, the plant puts on big fluffy roots with a big diameter," Blunier describes. "If it hits a compaction layer, the plant will struggle to get down because it thought it was in fluffy soil." In corn-on-corn situations, vertical tillage also helps shatter old root channels, destroying pockets of bacteria and creating pockets of air instead.

Get off the planter.

Verify that your planter is making the proper trench, there's no sidewall compaction due to heavy down pressure, and you're maintaining the proper seed depth, Blunier advises. "If your planter gauge wheels carry too much weight, they will compress the sides of the trench. However, if you