FLOPPY CORN SYNDROME IN JUNE BEGINS EARLY – ACTUALLY PRIOR TO PLANTING

BY: Mike Petersen, Orthman Agronomist

Fig. 1. Image of floppy corn – courtesy R.L. Nielsen, Purdue Univ.

University Extension Service bulletins are correct – proper planting depth is an important factor in this ugly scene. Let us explore more behind this rootless story a bit further.

For those who disk corn stalks from the previous crop a couple of times before planting and the soil does not settle and firm up with rain and/or time can really be in for a problem. All those shucks, leaves, cobs and stalks get mixed into the soil leaving large pockets, poor seedbeds and can dry out the soil. These new Bt corns are more resistant to overwinter breakdown leaving a lot of left-overs to deal with in the upper six to seven inches. The recommended depth to plant corn is 1.5 to 2 inches deep normally. But with top yielding corn there is over five tons per acre of corn residue mixed in and growers are about to plant right in the middle of this stuff. Quite a challenge!

So… the planter into high amounts of residue running in mixed dry and moist soil conditions will bounce, dip and dive, placing seed irregularly for depth unless there is some sort of down pressure on the row unit to minimize the bounce effect. Placing seeds on top of this residue does not insure proper seed to soil contact for germination and stand. These issues raise yellow and red flags to any farmer. When seeds lay atop the ground and never have a chance to germinate the big grumbly sighs are sounded and so are the grimaces on the faces.

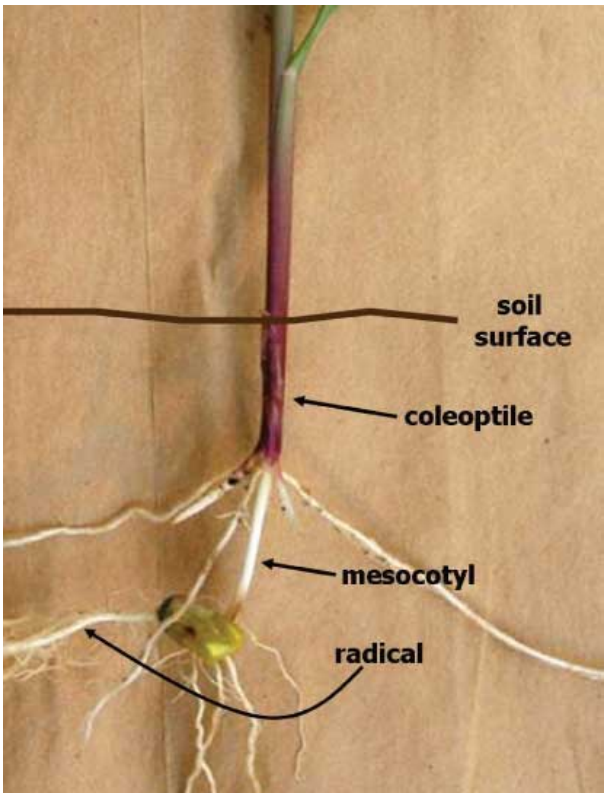

Fig. 2. Early root development, Iowa State Univ.

Why is planting depth so critical or is it to just avoid floppy corn or what? As the first set of nodal roots develop above the mesocotyl as seen in the image to the right they are much nearer to the soil surface just right at an inch above the seed. The force of gravity pulls down on those emerging roots which from all my years of county, digging and measuring roots may yield 4 to 10 roots. The reach of the lower coleoptile and mesocotyl will swell (enlarge) and above the first set of nodal roots will see nodal set numbers 2, 3, 4 and 5 develop. They stack on top of one another. Yes, they push closer and closer to the soil surface. If nodal root sets 3 and 4 develop above ground – floppy root syndrome is yours to keep. The distance between nodal sets 2 thru four is millimeters (fractions of an inch) apart. You ask so what?

Each of the first five nodal root sets (see Fig. 3) are essential to root growth, plant development and uptake of water and

nutrients. Nodal roots from node #2 should develop 6 to 12 roots, from node #3, 6 to 12 roots, from node #4 8 to 12 roots and from node five which may be ¼ to ½ inch above node 3 should develop 6 to 12 roots.

When one observes at 15 to 30 days after emergence, late May/early June; small stalks, purple coloration on the lower stems and floppy plants in the slightest of winds – a couple of things: seed placement and poor nodal root development. How many roots should your high powered, well traited corn crop have developed? Of what I said in the previous paragraph; 33 to 60 roots before the adventitious roots are counted. Plants with more roots will withstand droughty conditions, windy days, gain more water and nutrients and support a 8 to 11 foot tall crop.

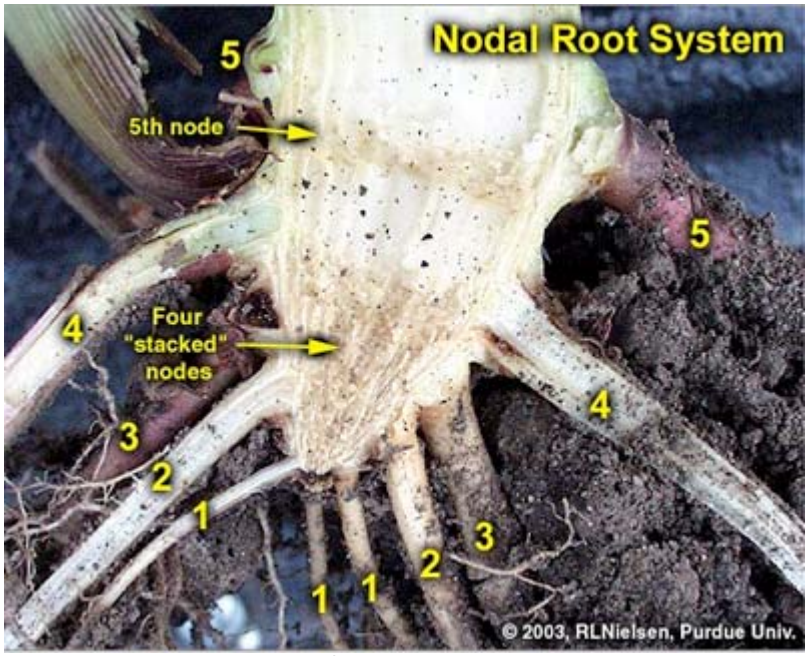

Fig. 3. Split nodal portion of corn – courtesy RL Nielsen, Purdue

Corn specialists from all over the U.S. will generally agree the more roots below ground the better off the crop and healthier the crop. This all starts by planting seeds at the right depth, in a good seedbed with excellent seed-to-soil contact conditions. Keeping residue out of the seedbed is very important to success also. A well tuned planter, that doesn't need tractor weights hanging all over it to keep in the ground will perform to place your seeds correctly especially in a firm, clean, mostly residue free seedbed.

There is an important item to consider; how one prepares and where one prepares the seedbed for the 2010 corn crop. Minimizing the massive mixing of residue into the soil surface is a very wise approach. With a high performing tillage system as in the Orthman Strip-Till System – you the grower can brush away residue, till a zone 8 to 13 inches wide and 7 to 11 inches deep between last year's rows or at an angle of those existing rows (when feasible depending upon topography, field layout, and irrigation concerns). As strip-till prepares a zone for the seed to start and assist in corn roots growing deep as quick as possible we want a clean strip to warm soon and insure top quality emergence. Having some precision placed pre-plant and/or starter fertilizer makes a lot of sense. Having to deal with residue with the inversion tillage method of the past is quite problematic and lends itself to the potential of floppy corn. With strip-till we can and do offer a better seedbed.

Fig. 5 Poor seedbed, open seed trench and seeds dropped on surface corn.

Fig. 4 1tRIP preparing seedbed in old soybeans

Obtaining a better seedbed, then planting without residue in the seedbed and planter bounce is what you desire with extra residue whether corn-on-corn or in a corn-soybean rotation – we believe farmers all across the U.S. using the Orthman 1tRIPr have that advantage. They get all the benefits of the residue for erosion protection, slowly releasing carbon back into the soil system, blanketing the soil from drying out, breaking down raindrop impact on a bare soil surface and saving input dollars too.

To summarize:

Definitely having the planter well set, planting at the depth of at least 1 ½ inch to 2 inches deep, keeping large amounts of residue out of the seedbed, a nearly level seedbed all makes a difference to keep from experiencing floppy corn. Instead of hair-pinning residue, cold seedbeds with too much residue, poor emergence, hanging heavy tractor weights on a planter to plant into a No-Touch high residue environment we see the strip-till system giving you a better option. With a well adjusted and well set strip-till system, the seedbed is prime for planting the seed so one can gain an even germination, stand, and a potential top yield. So to avoid the floppy corn syndrome getting the seed into a firm seedbed, clean of most residue, void of most root crowns and an area to warm and start the plant off right – we suggest Strip-Tilling.

Fig. 6 Orthman strip-till results at Oakes Experiment Station, ND