

## What Does seedplaced Fertilizer Injury look like in Cereals?

*Submitted by John Heard, Soil Fertility Specialist, Manitoba Agriculture*

Already we are hearing of spotty emergence with crops in Manitoba. Possible culprits may be dry seedbeds, poor quality seed, seed depth, herbicide residues, or seed placed fertilizer injury.

How might one confirm seedplaced fertilizer injury? The most definitive diagnosis is with a toggle of the fertilizer ON/OFF switch while seeding (Figure 1). A stand count then quantifies any stand reduction. The farmer then establishes his future risk – with his seeder and openers, on his soil texture, under his moisture conditions, fertilizer and seeding rate.

The following are pictures of injury I came across this spring, resulting from a low seedbed utilization (SBU) drill with ½” spread on 10” spacing on dry, sandy soil with some high rates of N and P applied with the seed. The stand differences were apparent from the road.

The wheat in Figure 1 below had a stand of 33 plants /sq foot on the right with low fertilizer versus 14 plants/sq foot with full N and P fertilizer. That’s a 44% crop stand versus the low rate fertilizer.



Figure 1. Seedplaced fertilizer on right side.

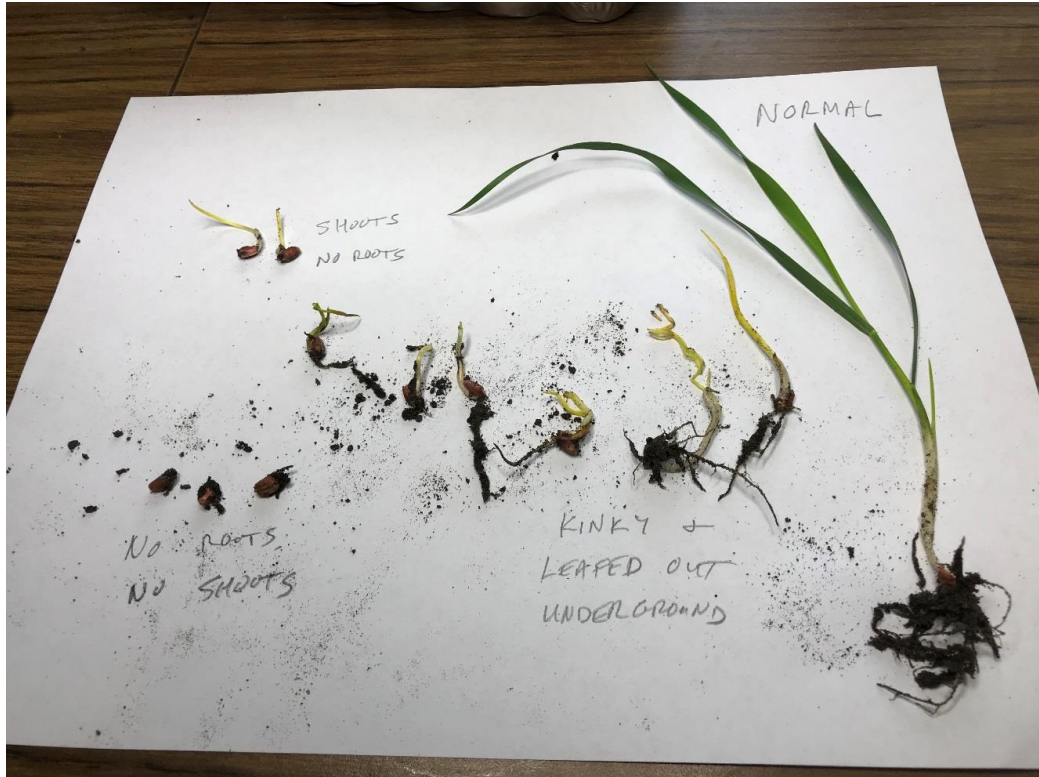


Figure 2. Seeds and seedling symptoms.

Actual seedling symptoms differ. Digging showed fertilizer granules in direct contact with many of the seed and distressed seedlings (Figure 2).

Closer inspection shows a range of symptoms (Figure 3).

1. Seeds that imbibed water but did not develop any root or shoot
2. Seeds that developed shoots but no roots
3. Seeds that developed root and shoot but leafed out below ground
4. Those that did germinate and emerge (about 44%) were ½ to 1 full leaf stage behind normal seedlings in the low fertilizer strip.



**Figure 3.** Type of seed and seedling injury.

Past Prairie studies suggested a 15% stand reduction was tolerable for cereals since surviving plants tillered and filled in the stand. But maturity is less uniform and is delayed up to 4 days.

Such thinned cereal stands are now dependent upon some rain, tillering and some aggressive weed control.

**What does seedplaced fertilizer injury look like in some other crops?**

Canola - where there has been fertilizer damage to excess N in the seedrow, the canola seeds just do not germinate and remain intact. Fields simply appear to have very poor crop establishment (Figure 4).



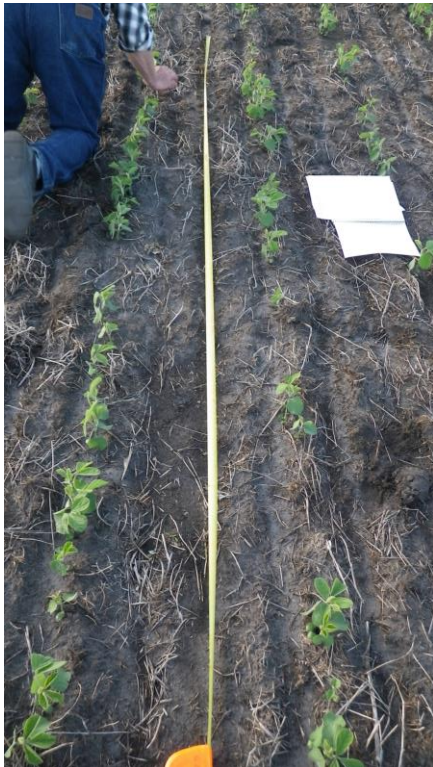
**Figure 4.** Seedplaced nitrogen stand reduction on canola on left (photo courtesy of T. Drummond, 2017)

Soybeans - stands may be injured by seedplaced fertilizer, especially with wider row spacing and on sandy soils under dry conditions – as seen in the following cases.



Figure 5. Liquid phosphorus fertilizer to soybeans on left.

Soybeans may benefit from potassium on sandy ground, but not when placed in the seedrow (Figure 6 and 7).



Figures 6 and 7. Fertilizer potash in row to the right. Note stunting and delayed emergence.

If you are diagnosing stand related injury in soybeans or dry beans, earlier scouting is better than later. The high N content of seeds tends to promote rapid deterioration and rotting of the seeds, which hampers the investigation.