Assessing crop stands when fertilizer is applied at seeding

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This year, even with rather wet soil conditions, I have had numerous inquiries about the safety of fertilizer applied at seeding, either seedplaced or sidebanded. Several risk factors are well understood, especially with seed-placed fertilizer: seedbed utilization (SBU, the amount of seedbed the fertilizer is spread over and calculated as opener spread/row spacing), soil texture, pH and moisture, fertilizer type and rate, and crop type. Manitoba has general recommendations for safe seedplaced fertilizer rates and an electronic Seed Placed Fertilizer Decision Aid calculator is available for use. During the past couple of dry springs, we have also seen crop stand thinning with high rates of nitrogen applied with some sideband units, something well documented in research plots of canola and flax.

Even with common guidelines, there is no substitute for knowing the impact of fertilizer placement, at a specific rate, on **your soil type**, with **your seeder**. To confirm the impact, you can leave a "check stamp" (not a check strip, since yield loss would be unacceptable with a long strip). A "check stamp" is a simple "FERTILIZER OFF" area, about 50 feet long or less, located at or just off the headland where you will not forget about it (Figure 1). We previously coordinated check stamps across Manitoba in 2002, to evaluate both seed and sideband placement of fertilizers.

Figure 1. Seedling emergence as effected by seedplaced fertilizer.

To determine the impact of fertilizer applied at seeding, follow these simple steps:

Step 1. Turn OFF fertilizer for 50 feet. Use a flag or pin to remember the area.

Step 2. Revisit the check stamp after emergence. Collect stand count data from adjacent passes using a yard or metre stick – compare emergence in the fertilized pass vs unfertilized. Also, compare the stage of development, since excessive but sub-lethal fertilizer rates can delay

growth and emergence. Alternatively, if soils are cool you may also see the positive response to starter fertilizer phosphorus and potassium.

Table 1. Data collection for “check stamp”.

	1	2	3	4	5	**Average Score**
Stand count per m						
Check stamp						
Fert applied						
Plant stage (leaf stage, height)						
Check stamp						
Fert applied						

In developing the original safe rates of seedplaced fertilizer for urea, it was estimated about 15% stand reduction in cereals or canola could be tolerated without yield loss since surviving plants would simply tiller or branch to compensate. However, for cereals, additional thinning generally meant a delay in maturity and possible loss of grade in short growing season areas.

Besides fertilizer and rate, also record the general soil texture and moisture conditions (moist, borderline, dry). These are large factors in explaining the injury or lack thereof.

Step 3. Don’t take to yield. The yields should be much less in the unfertilized area, but this stamp should only be used to visually demonstrate the importance of fertilizer for growth and maturity.

The data you collect should prepare you and your crop advisor to select safe rates and/or choose safer fertilizer sources for the future (or for as long as you own that seeder).