Station 6B: Nitrogen Placement for Corn

4R Nutrient Stewardship Self-Guided Tour

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There are numerous placement and timing options used for nitrogen fertilization by Manitoba corn growers. A 2017 survey of 100 Manitoba corn growers found no single application method predominates– there were some 12 timing and placement options used (Figure 1 below).

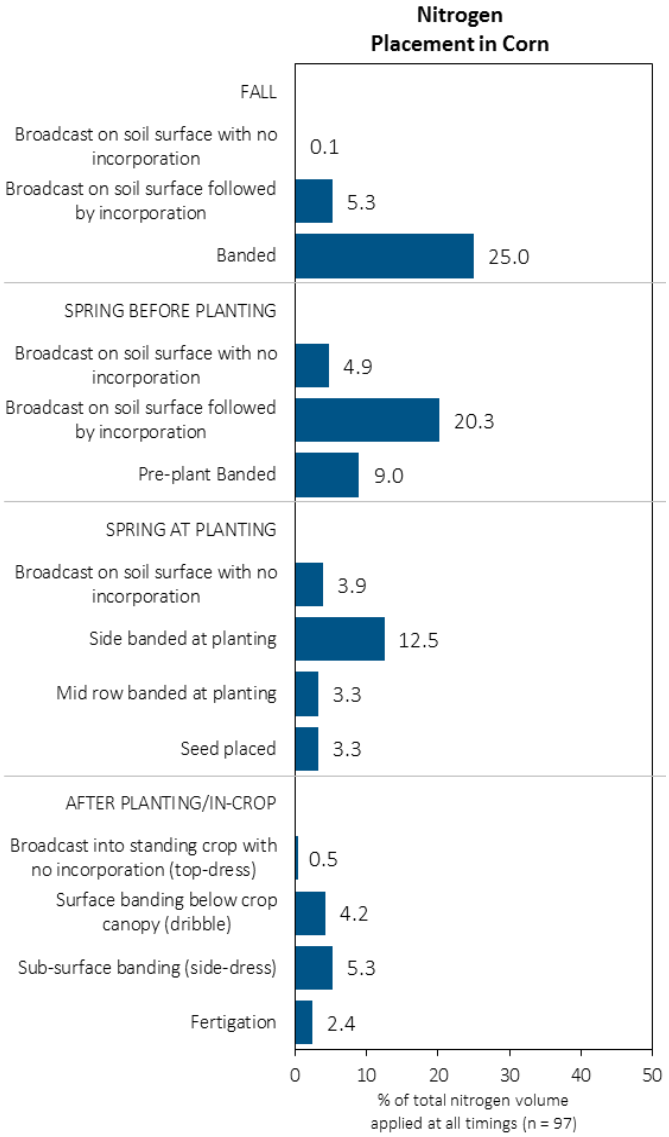

Figure 1. Nitrogen fertilizer placement and timing by Manitoba corn growers (2017).

The most common methods are fall banding or spring broadcast and tilled in. Now my observation is that fall applied N (about 30% of growers) predominates on heavier textured (clay) soils as those growers do not wish to do tillage before seeding in the spring. Spring application is more common on lighter textured soil, more vulnerable to overwintering leaching losses.

In-crop fertilization was used by only 10-15% of Manitoba growers, in contrast to 30-40% of Ontario corn growers. But interest in in-crop fertilization as side dressing or mid season dribble is increasing and much of the research at this site is studying those approaches.

Side dressing corn is popular in Ontario where years of research has shown a yield bump on some soils. But it is not always used to advantage in Manitoba. With fewer tile-drained fields here, growers know they are at risk of being shut out of fields if June is wet. Here are some pointers:

1. There is no need to wait for advanced leaf stages of corn. Side dressing can commence as soon as you can row the corn.
2. Sometimes we need help with slot closure.
    a. In one MB study with liquid UAN, we measured high ammonia losses when UAN was dribbled into an open slot with no closure. This is high risk and not recommended.

Figure 2. UAN dribbled into open slots.

    b. Usually anhydrous ammonia can be shanked in between rows at 3-4" depths without extra closing hardware when soils are of good tilth. But this year I've seen a number of fields of ammonia side-dressed corn with technicolour leaves (yellows and red), suffering ammonia escape from poorly closed slots. Some growers prepare for this with closure hardware, such as disk coverers of the slot.

Figure 3. Poorly closed ammonia slots on wet soils and leaf burning. Figure 4. Disk closure of ammonia slots

3. With ready access to high clearance sprayers there has been growing interest in split N applications with mid season dribble UAN (28-0-0) supplementing an earlier application in the fall or near seeding. Recent research has evaluated the appropriate timing for these operations.

Figure 5. Y drop application of dribbled UAN in corn.

The MB Corn Growers Association has conducted on-farm-tests with growers. Some 21 farms withheld 40 lb N/ac from before or seeding time operations and applied that 40 lb later in the season. In general, these placement and timings did not significantly affect yield (Figure 6). The exceptions were:

- In 1 case, withholding N until the V9 stage (close to tasselling) reduced yield
- in 2 cases the split application with the Y-drop applicator had higher yields.

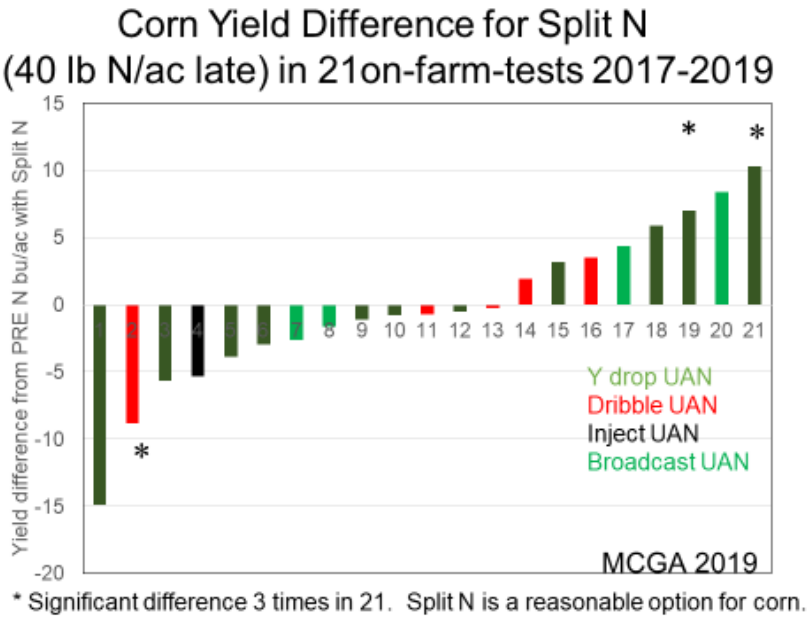

Figure 6. MB Corn Grower Association on-farm-test results.

In summary: It appears Manitoba growers have a wide range of placement options to apply our N effectively for corn.