Row Spacing Review

Narrow rows versus wider? Twin rows? Skip-row? Lock up half the drill openers?

With some of you contemplating purchases or trades of planters or drills, perhaps it's a good time to revisit the topic of row spacing. Even if you're committed to running your existing drill for several more years, it's wise to re-evaluate whether seeding any given crop is best accomplished using all the openers or locking half of them up. Here are some considerations:

First, you need to know the true optimum plant population per acre for each crop you grow. This sounds obvious, but we see many producers who frequently have dryland soybean populations thicker than necessary—a conclusion borne out by many studies.

Second, you need to know what your emergence percentages typically run, so you can calculate what your seeding rate should be. Or, another way of saying this, how often are you arriving at your target population? If there are huge variations in your actual stands, perhaps you should take a closer look at seed placement accuracy of the planter or drill, as well as investigating seed vigor and other agronomic issues related to stands (depth of planting, diseases, insects, pop-up fertilizer, etc.)

Now we can think about row spacing. You always want more crowding of plants *within* the row (on average) than *between* rows. This keeps machinery costs down, reduces horsepower requirement and fuel consumption, reduces the amount of frame weight needed to keep the openers consistently engaged, preserves more mulch cover, and results in fewer weed seeds being planted. Stated another way, even if it were agronomically desirable to have the plants the same distance apart *within* the row as compared to the distance *between* the rows ("equidistant": see diagram), this still wouldn't be the most advantageous row spacing from an economic standpoint.

Equidistant spacing occurs for:

7.5" rows at ~ 112,000 seeds/acre
10" -- 63,000
15" -- 28,000
20" -- 16,000
30" -- 7,000

For instance, if you typically seed milo (grain sorghum) at 50,000 seeds/acre, it would make no sense at all to plant on 10-inch spacing since the plants would be farther apart in-row than between rows. You would be much better off to lock up half the openers (which is easily done on most JD 50-, 60-, and 90-series no-till drills)

Some in-row crowding helps to (slightly) suppress the excessive tillering of crops such wheat, barley, millet, and milo, and causes soybeans and field peas to set pods higher as the plants stretch a bit to try to outgrow their neighbors early in their life. In many climates and crop rotations, it is also desirable to have some wider-than-equidistant gaps (the between-row spaces) to allow air flow, which results in quicker leaf drying and consequently less disease pressure. And, in many dryland situations, it is useful to have some gaps where the roots can 'find' moisture late in the season during grain fill (and for some regions & crops, cooling the canopy more readily at night can be helpful). So, agronomically, some crowding of plants in the row is desirable for most situations. However, excessively wide row spacings create problems for weed suppression and higher evaporation rates, as well as failing to efficiently intercept sunlight.

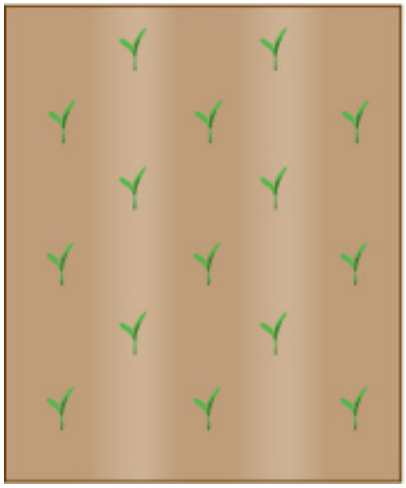
How much closer in-row than between rows? For highly determinate crops (and no branching or tillering) such as corn and sunflowers, the optimum may be 1.5 – 2 times wider between rows than in-row spacing (example: *if* 12 – 18 inches apart in-row, *then* 24 inches between rows). For plants with lots of branching potential and indeterminacy, such as soybeans, peas, milo, or canola, the optimum is probably more like 3 – 4 times as far between rows than (average) in-row spacing. Some crops such as wheat or barley usually end up with 6 – 10 times as far between rows than in-row spacing, partly due to cost and other physical constraints, although testing of yield effects generally show relatively small advantages (even in high-yield environments) to be gained from spacing the plants more equidistantly in ultra-narrow rows.

Row Spacing Examples

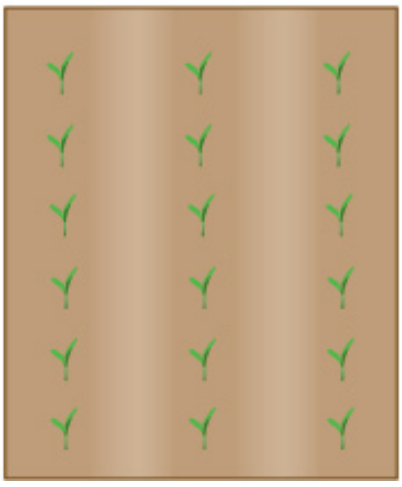
So, returning to our earlier example, even if you were seeding milo at 65,000 seeds/a, 20-inch rows would still be preferable over 10-inch. And even if you were planting soybeans at 130,000, you would still prefer 15-inch over 7.5-inch, and probably would prefer 20-inch over 10-inch.

Likewise, since the majority of environments have optimum corn plant densities not much beyond 28,000 plants/acre (and many far below that), 15-inch rows probably isn't such a good choice. And for similar reasons, paired-row ("twin-row") setups on 30-inch centers probably won't be economically optimum in most cases (this configuration averages rows 15 inches apart, since there are 2 rows on 30-inch centers; I'm not saying that twin-row on 30-inch performs exactly the same as 15-inch spacing, but simply that optimal corn plant

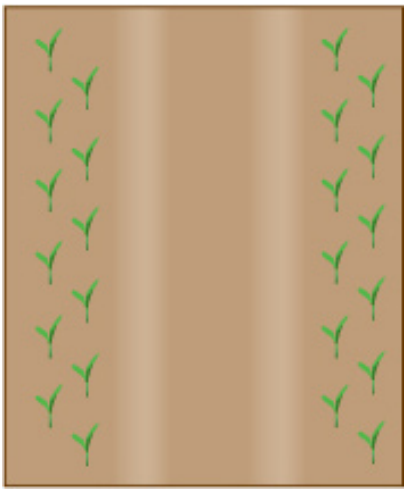
In all 3 diagrams, plant population per acre is the same:



True Equidistant



Conventional Rows



Paired Rows

populations generally aren't anywhere near high enough to justify so many openers). However, in some very high-yielding environments, particularly at high latitudes (e.g., the Canadian provinces), corn row spacing averaging 15 inches might have a slight advantage over 20-inch. But for the vast majority of corn-growing environments, twin-row on 30-inch centers will be economically inferior to single-row 20-inch, 22-inch, or 30-inch configurations.

In semi-arid regions, "skip-row" corn has shown some merit for blunting the effects of drought, although this configuration frequently causes yield drag in more normal or above-normal years. Skip-row is often accomplished by omitting rows from what would be a standard 30-inch planter, usually planting 2 rows, then omitting one (for a 45-inch average)—note that this can be thought of as paired-row on wide centers since it has about the same effect on plants (although you can't gather the pair during harvest as with narrower twin-row).

None of the foregoing discussion implies anything about precision of seed placement or whether seed is singulated (as with planters) or not (volume-fed grain drills including air drills). The question arises frequently for producers for whom narrow-row grain cropping (wheat, canola, peas) necessitates owning a drill, but who also grow some other crops (milo, soybeans) that are seeded at lower rates and wider rows: Is it economically advantageous to own a planter (or hire one) for those crops? I.e., how much yield is lost (if any) for a particular crop by virtue of seeds not being singulated, and/or seed placement being less precise than with a planter? —I shall defer this topic for a future newsletter.