Yield Observations When Shifting to Earlier Relative Maturity Soybean Products

Trial Objective

- A growing trend for soybean growers is to plant "early" soybean products (south of their normal adaptation) earlier in the season and managing them at a higher level with seed treatments and foliar applications of fungicide and insecticide. This phenomenon, dubbed "relative maturity (RM) shift" is becoming increasingly important in some locations.
- There are many benefits of planting "early" soybean products including:
  - Earlier harvest
  - Earlier cover crop seeding
  - Risk management benefits
- The objective of this study was to determine the yield impact of planting "early" (for the location) RM soybean products compared to planting normal RM products for the location.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Storm Lake, IA	Silty clay loam	Corn	Conventional	5/26/19	9/30/19, 10/8/19	65	175K
Marble Rock, IA	Silt loam	Corn	Strip tillage	6/3/19	10/17/19	55	152.5K
Huxley, IA	Clay loam	Corn	Conventional	6/6/19	10/11/19, 10/17/19	60	140K
Atlantic, IA	Silty clay loam	Corn	Conventional	5/16/19	10/17/19	70	150K
Victor, IA	Silty clay loam	Corn	Conventional	5/7/19	9/24/19, 10/17/19	65	140K

- The trial consisted of two sets – North and South.
- Each set had three Iowa locations:
  - North Set – Storm Lake, Marble Rock, and Huxley
  - South Set – Huxley, Atlantic, and Victor
- Each RM group consisted of 18 unique soybean products.
  - Nine products were considered early RM for the location:
    - North Set – 1.1 to 1.8 RM
    - South Set – 2.0 to 2.6 RM
  - Nine products were considered normal RM for the location:
    - North Set – 2.0 to 2.6 RM
    - South Set – 2.9 to 3.7 RM
  - The 2.0 to 2.6 RM group consisted of the same three products for both the North and South sets.

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- The trial was a mix of plot sizes, replications (reps), and row spacings:
  - Storm Lake (4 reps)—six row strips, 20-inch spacing
  - Atlantic (2 reps) and Marble Rock (4 reps)—four row strips, 30-inch spacing
  - Huxley (3 reps)—six row strips, 30-inch spacing
  - Victor (2 reps)—eight row strips, 30-inch spacing
- During the growing season, all sites recorded 20+ inches of rainfall with Atlantic receiving 32 inches total.
- The Marble Rock site received several heavy rainfall events.

Understanding the Results

- With later planting dates in 2019, the normal RM group showed a clear advantage of 6.0 bu/acre over the early RM group (Figure 1).
- Over the two years of this trial (2018-2019, Figure 2) the normal RM group had an average advantage of 3.8 bu/acre. In 2018, the early RM group had a yield advantage at three locations (Victor, Storm Lake, and Atlantic).

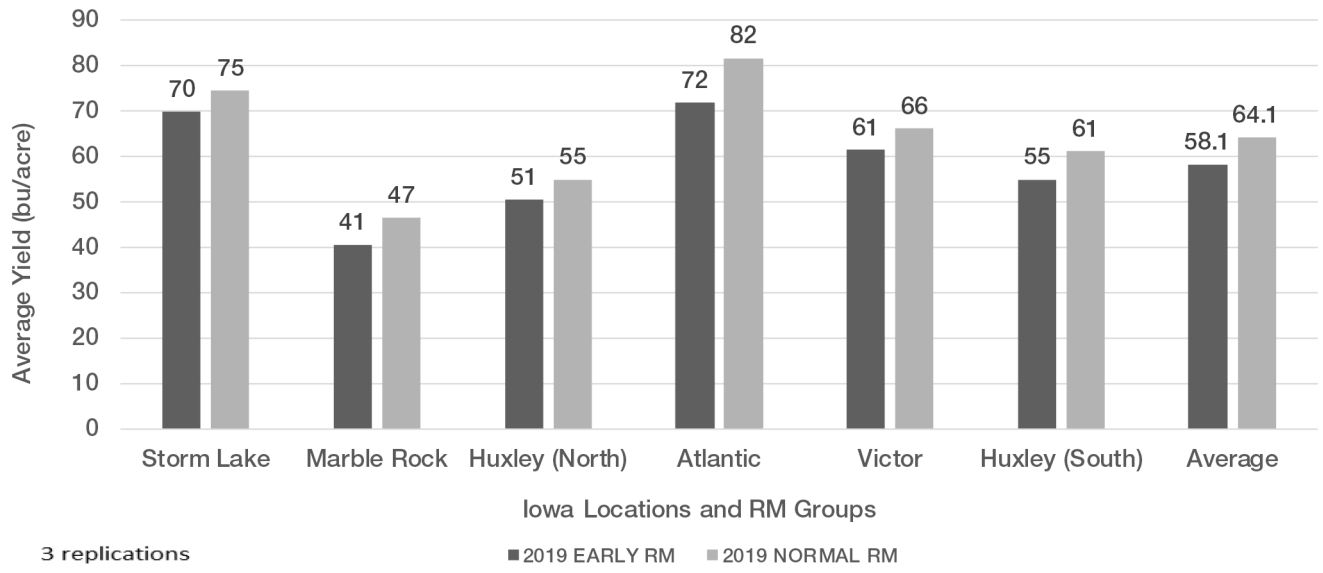

Figure 1. Relative maturity effects on the yield performance of 18 soybean products at Storm Lake, Marble Rock, Huxley (North and South sets), Atlantic, and Victor, Iowa in 2019. Data represents the average yields of nine products in each RM group for each location.

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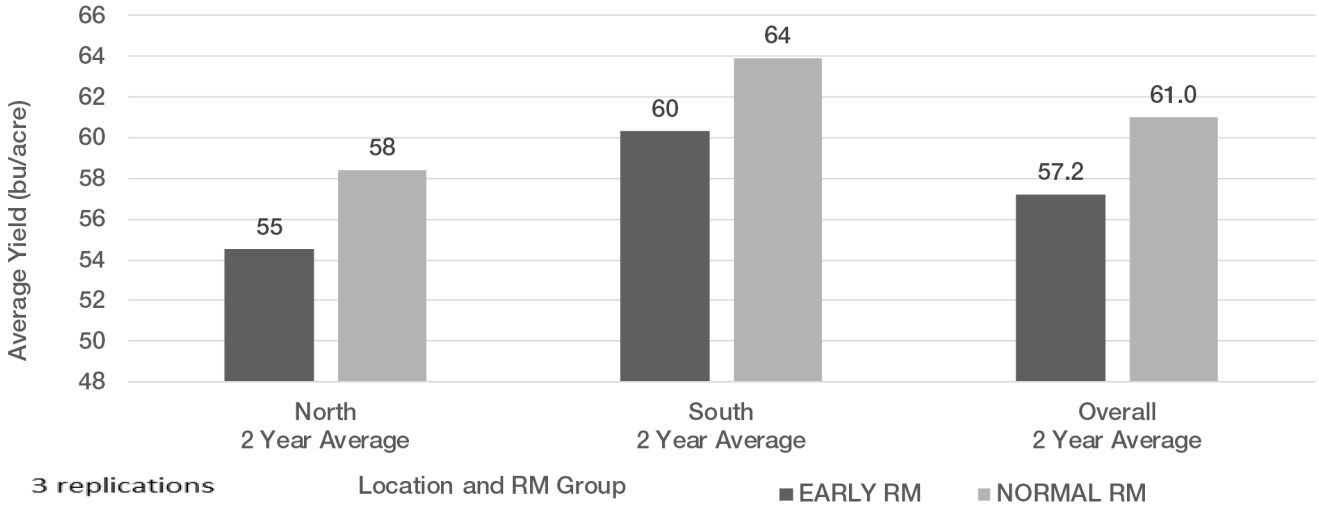

*2018: Storm Lake, Fonda, Marble Rock (north and south), Huxley (north and south), Atlantic, Shenandoa, Victor
2019: Storm Lake, Marble Rock, Huxley (north and south), Atlantic, Victor

Figure 2. Relative maturity effects on the yield performance of soybean products at 15 site-year locations in Iowa. The results represent the average yields of nine products in each RM group for each location.

Key Learnings

- In 2019, the early RM products yielded, on average, 6.0 bu/acre less than the normal RM products and yields ranged between 4 to 11 bu/acre less than the normal RM products.
- In 2019, rainfall was plentiful with Marble Rock receiving the heaviest one-time event, and with Atlantic receiving over 32 inches total.
- The two-year data indicates that early RM soybean products can be competitive if the proper genetics are selected.
- More research needs to be conducted in the genetic pipeline to better understand which soybean products can be grown south of their main area of adaptability.
- It should be noted that a RM shift may not be for every operation and that its benefits could be defined in terms other than yield.

Legal Statement