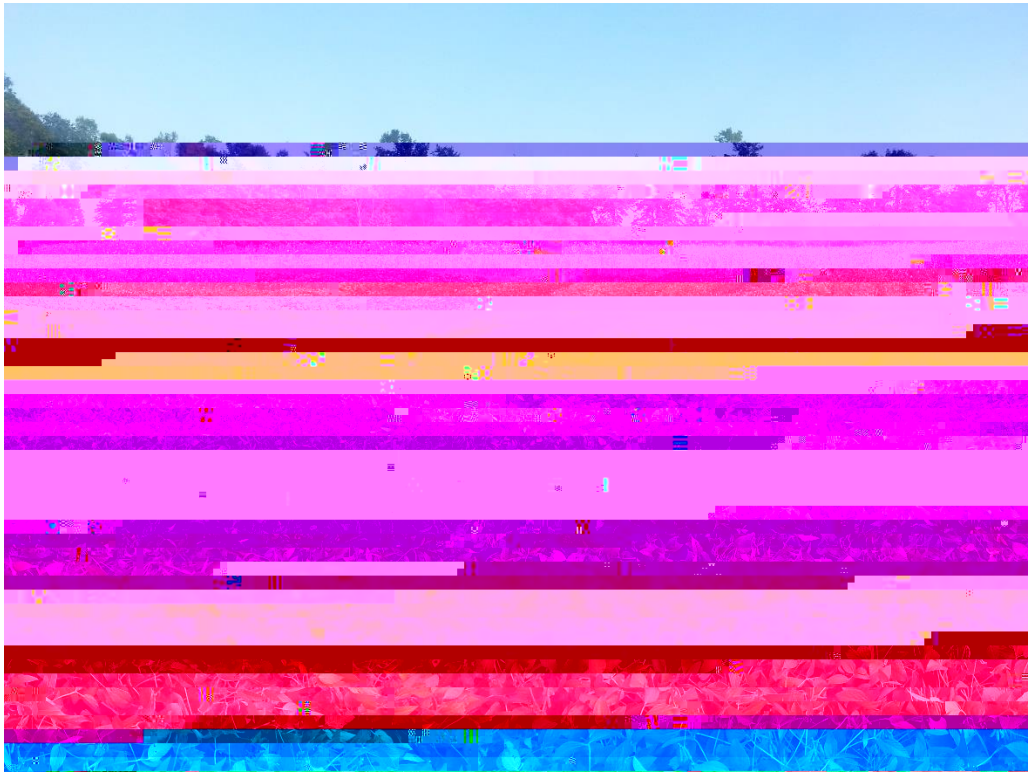
Impact of Planting Date and Variety on Soybean Yield



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and pest/disease incidence. No major pest or diseases were observed so a formal scouting was not conducted.

On 14-Oct, the soybeans were harvested using an Almaco SPC50 small plot combine. Seed was cleaned with a small Clipper M2B cleaner (A.T. Ferrell, Bluffton, IN). They were then weighed for plot yield, tested for harvest moisture and test weight using a DICKEY-John Mini-GAC Plus moisture and test weight meter. Soybean oil was extruded from the seeds with an AgOil M70 oil press on 14-Nov, and the amount of oil captured was measured to determine oil content and oil yield.

Yield data and stand characteristics were analyzed using mixed model analysis using the mixed procedure of SAS (SAS Institute, 1999). Replications within trials were considered random effects, and treatments were treated as fixed. Treatment mean comparisons were made using the Least Significant Difference (LSD) procedure when the F-test was considered significant ($p<0.10$). Variations in yield and quality can occur because of variations in genetics, soil, weather, and other growing conditions. Statistical analysis makes it p

Table 3. Weather data for Alburgh, VT, 2020.

Alburgh, VT	May	June	July	August	September	October
Average temperature (°F)	56.1	66.9	74.8	68.8	59.2	48.3

The significant interaction between relative maturity and planting date for harvest moisture indicates that soybeans of different maturity groups produced different responses in terms of harvest moisture to altering planting dates (Figure 2)
maturity thus reducing seed moisture co
varieties to begin to outperform longer season varieties as planting dates are delayed. However, this is not the trend we observed in 2020. As planting dates were delayed, both the early and late maturity group varieties experienced a decline in harvest moisture until the 6th planting date, after which time the harvest moistures greatly increased.

Figure 2. Soybean relative maturity x planting date interaction for harvest moisture, 2020.

The significant interaction between relative maturity and planting date for yield indicates that soybeans of different maturity groups have different yield responses to delaying planting dates (Figure 3). We would expect shorter season varieties to begin to out yield longer season varieties as planting dates are delayed. However, that is not what we observed in this trial. Although we did see the later maturing variety out yielding the early maturing variety in early planting dates, both varieties experienced significant yield declines as planting dates were delayed beyond mid-June and the early maturing variety did not outperform the late maturing variety at these dates. This indicates that, even for shorter season varieties, delaying planting until late June or later will have a significant impact on soybean yields. This was likely impacted by the early frost that negatively affected both maturities despite adequate GDDs. The extremely low yields experienced in the first two planting dates was likely due to an error in herbicide application that contributed to damage to early planted treatments, not a factor or the planting date itself. This is further evidenced by growth stage data collected throughout the season that shows the first two planting dates aligning with the growth stages of soybeans planted 3-4 weeks later.

Figure 3. Soybean relative maturity x planting date interaction for yield, 2020.

Impact of Variety

The two soybean maturities performed significantly different in terms of harvest moisture and test weight, but were statistically similar in all other harvest characteristics (Table 4). Moisture at harvest was 0.5% lower in the short season variety, however, both varieties were above a safe storage moisture and required additional drying prior to storage. Similar moisture content between maturity groups suggests that both the longer and shorter season varieties reached similar maturity by the time of harvest. Test weights varied slightly between varieties with the

DISCUSSION

Soybean yields were significantly impacted by planting date, with the highest yields observed when soybeans were planted between late-May and mid-June. These data suggest that delaying planting of soybeans beyond this is likely to result in depressed yields. An erroneous herbicide application likely impacted the first two planting dates. There was no significant difference in oil content between planting dates. Soybean yield was not significantly impacted by relative maturity of the variety as both varieties were able to reach maturity and produce high yields. However, these trends may not hold in years with more normal GDDs accumulation.

In conducting soybean planting date evaluations since 2017, we have identified that soybean can be planted as late as mid-June in this region without typically exhibiting any yield loss. However, in years where cool wet weather was present on either end of the growing season, soybean performance was negatively impacted. Therefore, e