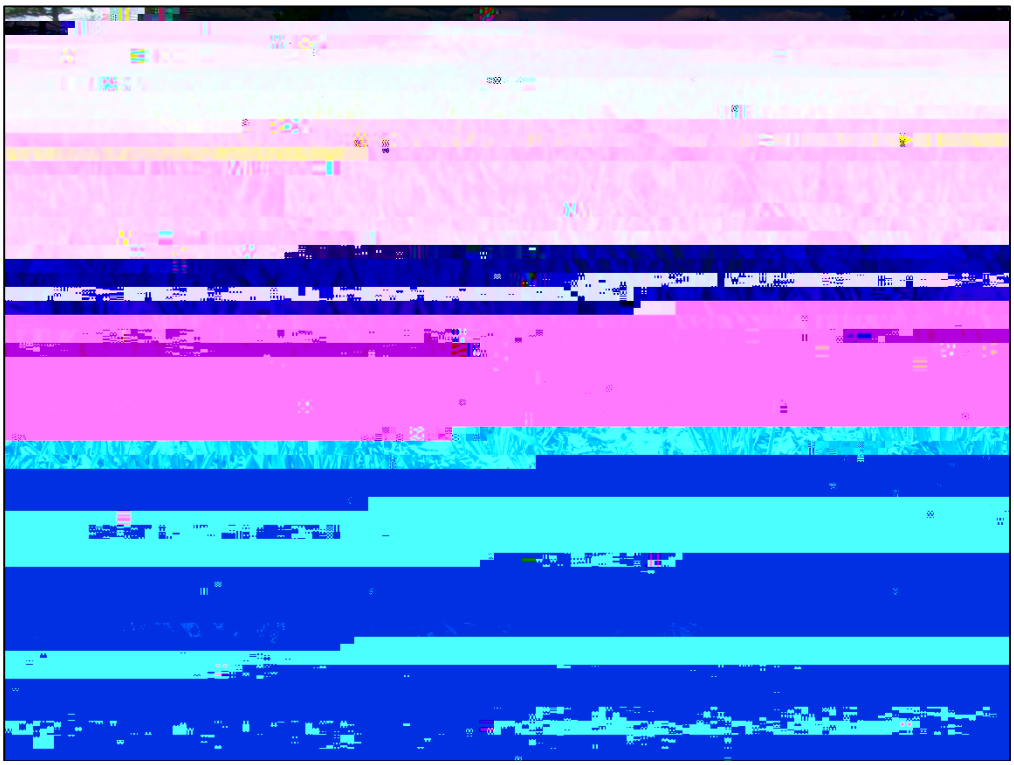
2020 Rye Harvest Date



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2020 RYE HARVEST DATE

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The interest in growing cereal rye for grain to be sold as cover crop seed, or to other value-added markets (distillers and bakers), has increased considerably across the Northeast region. As a result, farmers and end-users are requesting yield and quality information on cereal rye varieties. In 2020, University of Vermont Extension Northwest Crops and Soils (NWCS) Program conducted a harvest date trial to evaluate the effects of harvest date on yield and quality of cereal rye. Wheat and barley require timely harvest to maintain quality, particularly falling number, for successful baking and brewing. It is unclear to what extent harvest timing impacts falling number in cereal rye. Subsequently, there is little knowledge if rye with high or low falling number is required for baking. The goal of this project was to evaluate the impact of harvest date on yields and quality parameters, specifically falling number, across two rye varieties.

MATERIALS AND METHODS

The field was plowed, disked, and prepared with a spike tooth harrow to prepare the seedbed for planting. The experimental design was a randomized complete block with split plots and 4 replicates. The main plots were harvest date and the split plots variety (Danko and Hazlet). The plots were planted with a Great Plains cone seeder on 20-Sep 2019 and plots were 5' x 20' (Table 1). Prior to first harvest date, on 23-Jul 2020 and each subsequent harvest date, three plant heights per plot were measured.

Table 1. Agronomic and trial information for the rye cover crop variety trial, 2019-2020.

	Borderview Research Farm, Alburgh, VT
Soil Type	Benson rocky silt loam
Previous Crop	Spring grains
Tillage Operations	Fall plow, disc, and spike tooth harrow
Harvest Area (ft.)	5 x 20
Seeding Rate (live seeds m^{-2})	350
Replicates	4
Planting Date	20-Sep 2019
Harvest Dates	HD 1: 23-Jul 2020 HD 2: 29-Jul 2020 HD 3: 7-Aug 2020 HD 4: 12-Aug 2020

Grain plots were harvested at the Alburgh site with an Almaco SPC50 plot combine on 23-Jul, 29-Jul, 7-Aug, and 12-Aug. Following harvest, seed was cleaned with a small Clipper M2B

Impact of Harvest Date

Yield, harvest moisture, and test weight were measured at the time of harvest (Table 3). From the four different harvest dates (HD), yields were highest at HD1 on 23-Jul at 4648 lbs ac^{-1}. Yields from the first two harvest dates were significantly different from the second two harvest dates. Harvest moisture varied

Impact of Variety

While yields did not differ as an impact of harvest date, there were varietal differences between Danko and Hazlet with an average trial yield of 4052 lbs ac^{-1} and 4102 lbs ac^{-1} respectively, though the yield differences were not significant (Table 5). There were significant differences in test weight by variety, Danko at 54.6 lbs bu^{-1} and Hazlet at 53.5 lbs bu^{-1} and falling number with Danko averaging 224 seconds and Hazlet averaging 139 seconds. Overall, Danko had insignificantly lower yields and protein

on the end product. Because rye bread relies on different grain components to create high-quality bread, and ferments more quickly than wheat, it is expected that lower falling numbers are preferred for rye than for wheat, possibly closer to 100-200.

Looking at falling number, in the 2019 Harvest Date Trial (Figure 1) Hazlet had a more severe drop in values over the 4-week period, decreasing by 139 seconds from HD1 to HD4, compared to Danko which decreased by 96 seconds from HD1 to HD4. In this year's trial, however, Danko had a more severe drop over the 4-week harvest period, decreasing by 124 seconds from HD1 to HD4, while Hazlet decreased 97 seconds over the same period. Hazlet did have significantly lower falling number values overall in the trial.

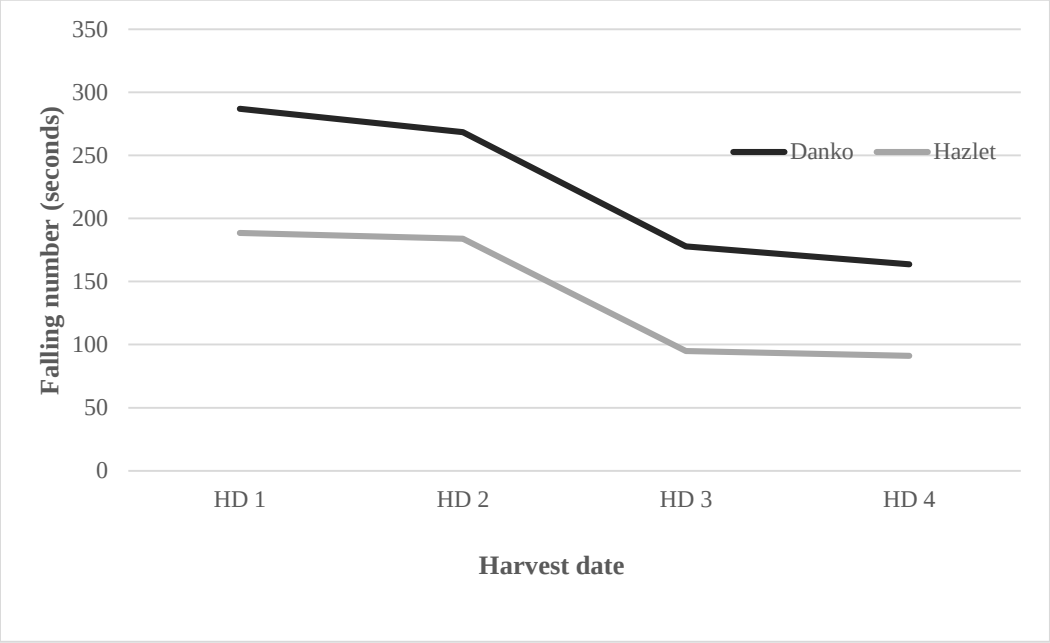

Figure 1. Interaction between harvest date and variety for falling number, 2020.

Figure 2 shows the same falling number trends from Figure 1 alongside observed rainfall between each harvest date. From 1-Apr to 23-Jul (HD1) there was 9.24 inches of rainfall, nearly 4 inches less than the 30-year average. One inch of rain fell between HD1 and HD2, over 4 inches fell between HD2 and HD3, and less than a quarter inch between HD3 and HD4. On 4-Aug, there was a 2.98 inch rainfall event which most likely began the sprouting process in HD3 and HD4. The HD3 occurred three days after the rainfall, with an additional 0.12 inches falling before HD4 (Table 6). Though small amounts of rainfall, or even prolonged periods of humid weather, can increase the risk of pre-harvest sprouting and, in turn, lower the falling number, this is a clear example of that happening in early August.

Date	Rainfall (inches)
27-Jul	1
29-Jul	0.
30-Jul	0.4

Figure 2. Interactions between rainfall and falling number values during harvest period, 2020.

DISCUSSION

During a harvest period with greater amounts of rainfall from week to week, there is greater potential for reduced quality crops. This can be an important consideration when attempting to determine ideal harvest windows as you may be forced to harvest at an earlier date to salvage a crop and maintain grain quality. While harvest date did not appear to impact yields, it did have an effect on grain quality. This trial also indi1(em)152.025(da)9(t)-4(e 104 Tf1 0 0 1 72.024 387.07 Tm0 g0 G[(Whi)5(l)-4(e)-77(h)11(ar)-5(v)11(es0 g0 0 1 72.02

ACKNOWLEDGEMENTS

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