Project Title: Kernza planting date study

Objective: To evaluate the performance of kernza varieties with different planting dates

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Summary:

Kernza is perennial intermediate wheatgrass known for its extensive root system that uses nutrients more efficiently than wheat. This is the first experiment about kernza conducted at the research center.

Four kernza entries, C3, C4, Clearwater, and Rush were planted in the fall of 2019 on three planting dates (20-Sept., 27-Sept., and 04-Oct.) through the spring of 2020 on two planting dates (17-Apr. and 01-May). Kernza was planted at a seeding rate of 4 live seeds/ft^2 at 0.5-inch depth with 3.28-ft row spacing. Table 1 specify other kernza management information.

Kernza planted in 20-September resulted in both higher grain yield (707.6 lbs/A) and biomass (3.3 t/A) production compared with later planted kernza (Table 2). In terms of biomass, there was no interaction between planting dates and kernza entries. We found yield reduction of kernza biomass as planting was delayed (Table 2) across the kenza entry (Table 3). Among the kernza varieties, Clearwater had the highest biomass production (2.4 t/A). Regardless of planting dates, Rush had lowest biomass production.

We found a significant interaction between planting dates and kernza varieties on grain yield. While there is a general trend of lowered grain as planting was delayed, Clearwater showed yield advantage with planted early (e.g., sept 20-27, 2019). C3, on the other hand, showed a grain yield advantage when planted later in spring (April 17 and May 1, 2020).

Table 1. Management information

Seeding rate:	4 live seeds/ft2	**Field Location:**	X5
Previous crop:	Canola	**Soil type:**	Silty loam
Herbicide:	None	**Tillage:**	Conventional
Nutrient fertilizer applied (N, P_2O_5, K_20 lb/A):	(Fall, 2019):45-80-0-(10S)	**Soil residual nutrient (NO_3^-, P, K lb/A):**	59-16-260

Table 2. Planting date effect on kernza aboveground biomass

Planting dates	**Biomass (t/A)**
20-Sep-19	3.3a
27-Sep-19	2.2b
04-Oct-19	2.3b
17-Apr-20	1.7c
01-May-20	1.2d
Mean	2.2
P-value	<0.001

Table 3. Varietal effects on kernza biomass

Varieties	**Biomass (t/A)**
Clearwater	2.4a
C4	2.1b
C3	2.0b
Rush	1.9b
Mean	2.1
P-value	<0.001

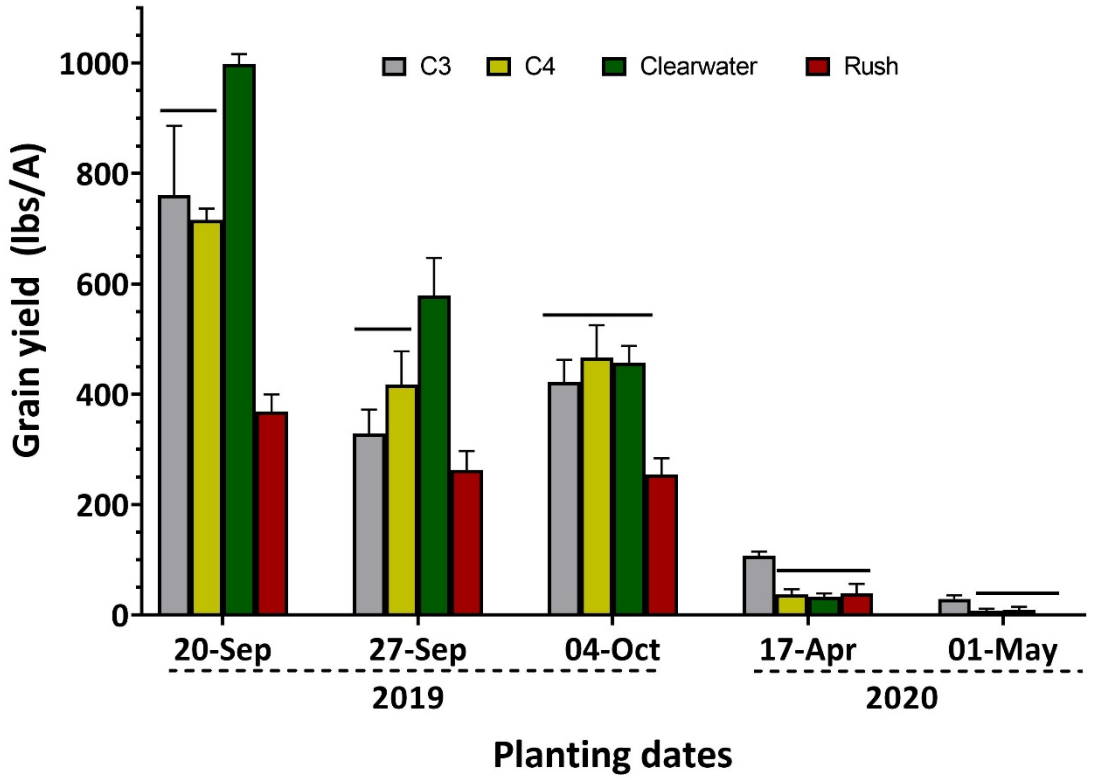

Figure 1. Interaction of planting date and variety for grain yield. Horizontal line denotes no statistical difference (α = 0.05) within a planting date.