



Economic impacts of delayed planting: Field trial results

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Growers are anxious to get their crops planted and growing each fall and spring, and for good reason. A day's delay in seeding resulted in yield decreases per acre of 34 pounds for spring barley, 33 pounds for spring wheat, 31 pounds for winter wheat, 22 pounds for spring canola, and 18 pounds for spring peas in a nine-year no-till cropping systems trial on the Cook Agronomy Farm (CAF) near Pullman, WA (Table 1). Using average marketing year prices received by growers in the REACCH production region for 2009 through 2013, we calculated that the daily penalty was highest for spring canola at \$4.46 per acre,

IMPACT

Delayed planting causes financial hardship for growers. In addition, it can affect crop insurance claims. Nine years of planting, yield, and price data on no-till wheat-based systems from the Cook Agronomy Farm, an official Long-Term Agroecosystem Research (LTAR) site designated by the U.S. Department of Agriculture, provide results that are sufficiently robust to assist growers, educators, and policymakers with planting decisions.

followed by hard red spring wheat at \$3.83, hard red winter wheat at \$3.38, barley at \$2.94, and peas at \$2.65.

We calculated these results by comparing the average change in yield per day to the crop yield for the earliest planting date at CAF for this nine-year time period. Spring crops were planted as early as March 24 and as late as May 12, a span of 49 days. Winter wheat

planting dates ranged from September 30 to October 25, a range of 25 days. While spring barley had a slightly larger decline in daily yield than the other crops, the price per pound was higher for spring canola, hard red spring wheat, and winter wheat, resulting in larger financial penalties per day for delayed planting of these crops.

The earliest planting date for no-till hard red spring wheat during the period of study was March 24, while the latest planting date was May 5, a 42-day span (Figure 1). The highest spring wheat yield of 82 bushels per acre occurred with an April 3 planting date in 2004. March planting dates resulted in spring wheat yields of 74 bushels (March 24 planting) and 60 bushels (March 26 planting). In the last two years of the study, spring wheat was planted in early May, with yields of 42 bushels and 61 bushels per acre. Obviously, planting date is not the only variable that determines crop yield, but it is an important factor with a strong correlation.

Winter wheat yield was highest at 93 bushels per acre with a September 30 planting, but the second highest yield of 91 bushels per acre occurred following an October 25 planting (Figure 2). The yield impact by planting date for fall-planted crops is weaker than for spring-planted crops due to the longer time period, effects of overwinter precipitation, and other weather-related variables.

Spring barley yields were lowest, at 1.45 and 1.61 tons per acre, when the crop was planted in early May, although a May 12 planting resulted in a 2-ton yield in 2009 (Figure 3). When barley was planted by April 16, yields were 2.3 tons per acre or more. Spring canola yields exceeded 2,700 pounds per acre when the crop was planted on March 26 in 2001, and on April 12 in 2004, although an April 8 planting resulted in a very low yield of 1,059 pounds per acre in 2005 (Figure 4). Obviously, factors other than planting date affected the spring canola crop in that year.

Growers also face planting deadlines imposed by crop insurance programs. The intent of these planting deadlines is to ensure that the growing season is adequate for crop production. During years of adverse planting weather, growers may end up using the "prevented planting" provision, which provides an indemnity based on the fact that they were unable to seed by the planting

Table 1. Yield and economic impacts of a day's delay in planting based on field-scale yield results with no-till planting at the Cook Agronomy Farm, 2001 to 2009, using five-year average regional farmgate crop prices for 2009 to 2013 (U.S. Department of Agriculture National Agricultural Statistics Service).

Crop	Unit	Price ¹	Price per unit	Impact of planting delay		Planting dates	
				Pounds per day	Cost per day	Earliest	Latest
Spring canola	cwt	\$20.10	\$0.20	-22.21	-\$4.46	March 26	May 12
Hard red spring wheat	bu	\$7.04	\$0.12	-32.68	-\$3.83	March 24	May 5
Hard red winter wheat	bu	\$6.57	\$0.11	-30.90	-\$3.38	Sept 30	Oct 25
Spring barley	ton	\$171.58	\$0.09	-34.31	-\$2.94	March 26	May 12
Spring peas	cwt	\$14.48	\$0.14	-18.27	-42.65	April 24	June 2

¹ Prices are 2009-2013 marketing year average prices received by farmers, USDA-NASS
bu = bushels, cwt = hundredweight

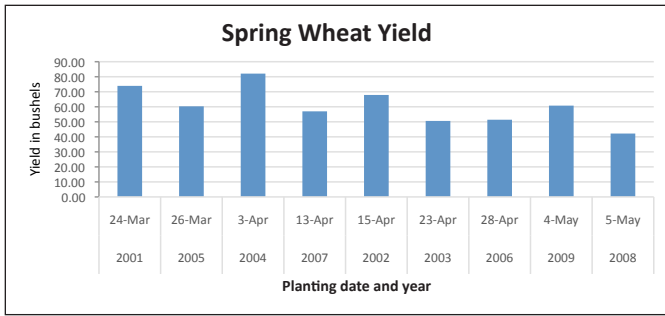


Figure 1. Relationship between planting date and yield for no-till hard red spring wheat, 2001 to 2009, Cook Agronomy Farm, Pullman, WA.

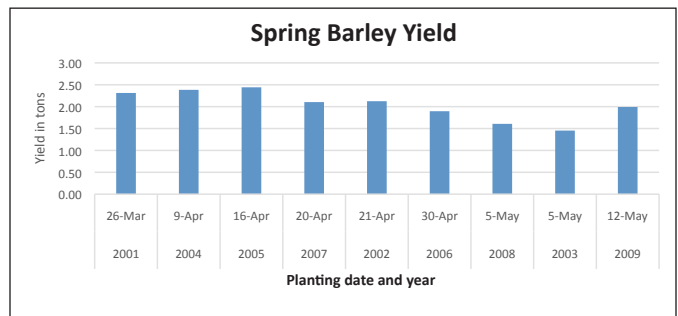


Figure 3. Relationship between planting date and yield for no-till spring barley, 2001 to 2009, Cook Agronomy Farm, Pullman, WA.

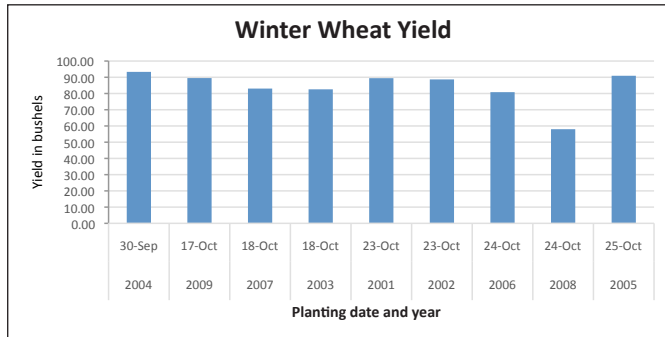


Figure 2. Relationship between planting date and yield for no-till hard red winter wheat, 2001 to 2009, Cook Agronomy Farm, Pullman, WA.

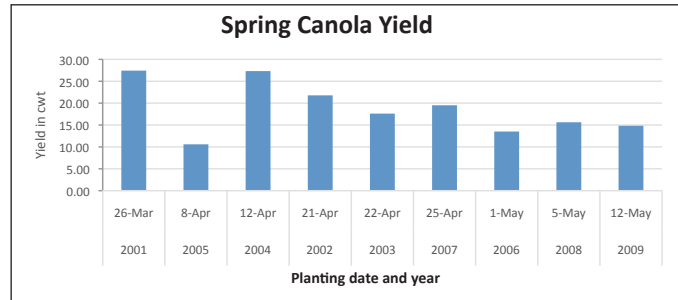


Figure 4. Relationship between planting date and yield for no-till spring canola, 2001 to 2009, Cook Agronomy Farm, Pullman, WA.

deadline. They cannot seed past this date and receive the indemnity. The correlation between planting date and yield, while not perfect, is obvious from these nine years of data.

Direct seeding has some advantages over conventional tillage in terms of timely planting, as fewer preplanting tillage passes

are needed to prepare the ground for planting. During cool, wet springs, however, direct-seeded ground tends to remain cool and wet longer than conventionally tilled land. While there are many more factors affecting yield than planting date, time of planting is a strong determinant of yield potential.



Photo by Brad Stokes.