

Phosphorus Fertilization of Late-Planted Winter Wheat in No-Till Fallow

Applied Research in the Low-Precipitation Zone

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Introduction

Wheat growers interested in experimenting with or transitioning to no-till fallow are concerned about reduced yields caused by late planting. Late planting is necessary in no-till fallow because seed-zone moisture during optimum planting dates (late August to mid-September) is almost always inadequate for germination and emergence.

Growers who practice no-till fallow begin planting in October. This is often a “dusting-in” operation. Seed is placed in dry soil about $\frac{3}{4}$ of an inch below the surface. Stand establishment is initiated later, after the onset of fall rains. Seedlings grow slowly and reach the 3- or 4-leaf stage before cooler winter temperatures force plants into dormancy. These plants are much smaller and have fewer tillers than wheat planted earlier in the fall. The yield penalty associated with late planting, or delayed growth and development, typically ranges from 7 to 20 bu/a in the low-precipitation zone (less than 12 inches of precipitation per year), but growers have minimized, and in some years eliminated, this problem by using modern grain drills to apply nitrogen (N) and sometimes sulfur (S) close to the seed while planting.

Enhancing the supply of phosphorus (P) in the soil could further improve the grain yield of late-planted winter wheat in no-till fallow. Research conducted in tilled fallow suggests that response to applied P



Figure 1. Winter wheat production in the low-precipitation zone of Oregon and Washington occurs on plateaus and uplands bisected by ravines, canyons, or drainages. Soils are mostly deep silt loams or very fine sandy loams formed in windblown loess.

Photo by Larry Lutcher, © Oregon State University.

occurs more often when winter wheat is planted in late fall, and similar results have been reported for annually cropped wheat in areas with higher rainfall. This publication describes results of field research conducted to determine if P fertilization improves the grain yield of late-planted winter wheat in no-till fallow. Results and conclusions are applicable to the low-precipitation zone of Oregon and Washington (figure 1).

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