

Influence of Fallow Tillage on Jointed Goatgrass Emergence and Competition in Winter Wheat

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Objective:

To evaluate the effect of post-harvest tillage on germination of jointed goatgrass and crop interference in a winter wheat – fallow cropping system.

Treatments:

- ✓ Immediate post-harvest disking
- ✓ Post-harvest disking late fall
- ✓ Post-harvest disking early spring
- ✓ Post-harvest disking late spring
- ✓ Disking at all times
- ✓ No tillage



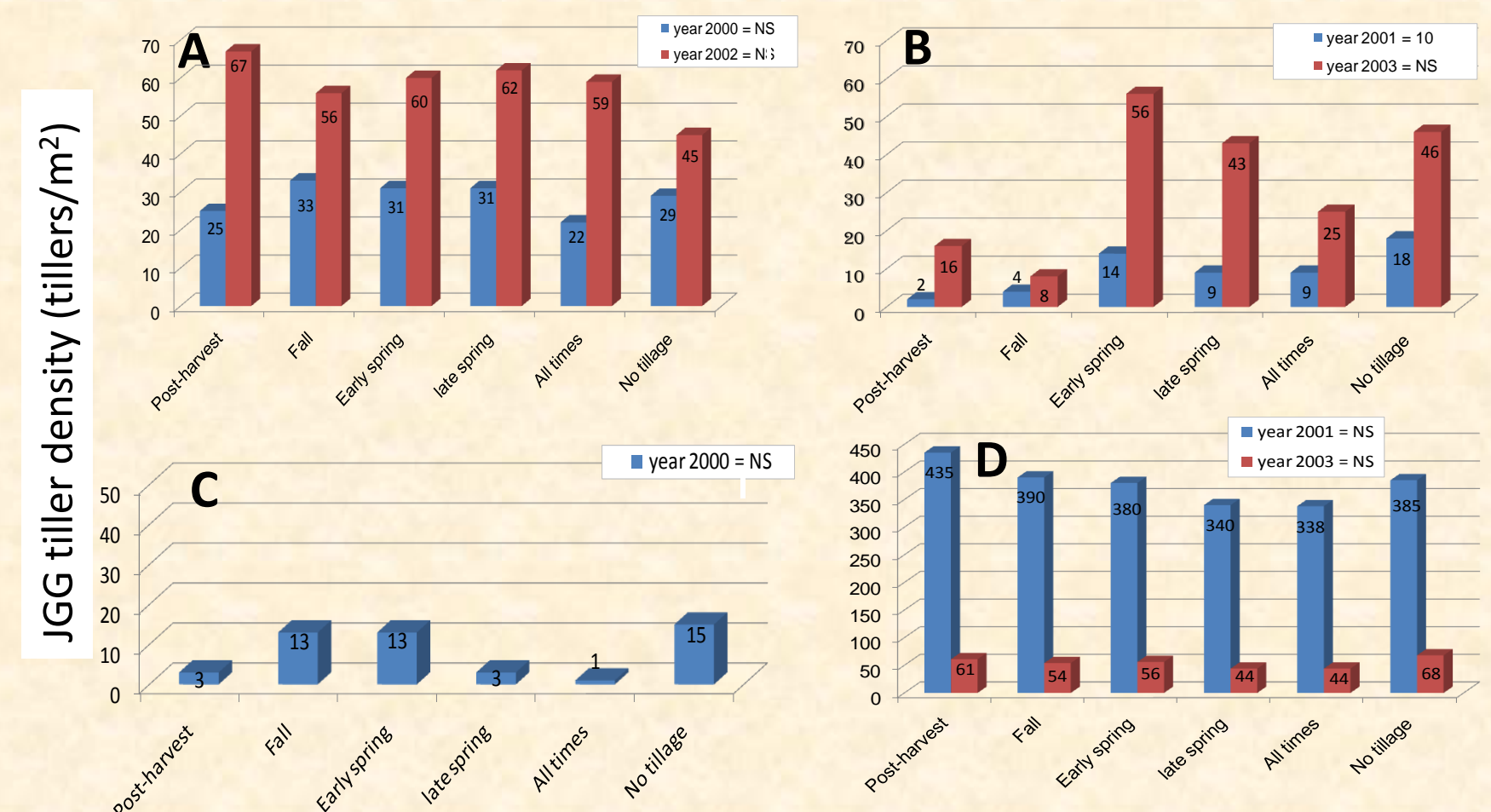
Methods:

Jointed goatgrass (JGG) was broadcast seeded into cereal stubble after harvest in a winter wheat-fallow system. Tillage treatments, as described above, consisted of a light disking. JGG and other weeds were subsequently controlled during the fallow period. After winter wheat planting, JGG populations and wheat yields were assessed. The tillage treatments were applied again after the first year wheat harvest, and a second fallow-winter wheat cycle was repeated with JGG densities and wheat harvest assessed. Studies summarized here were from sites near Moro, Oregon, and Blue Creek, Utah. A study near North Platte, Nebraska was also conducted (see adjacent poster in this session).

Results:

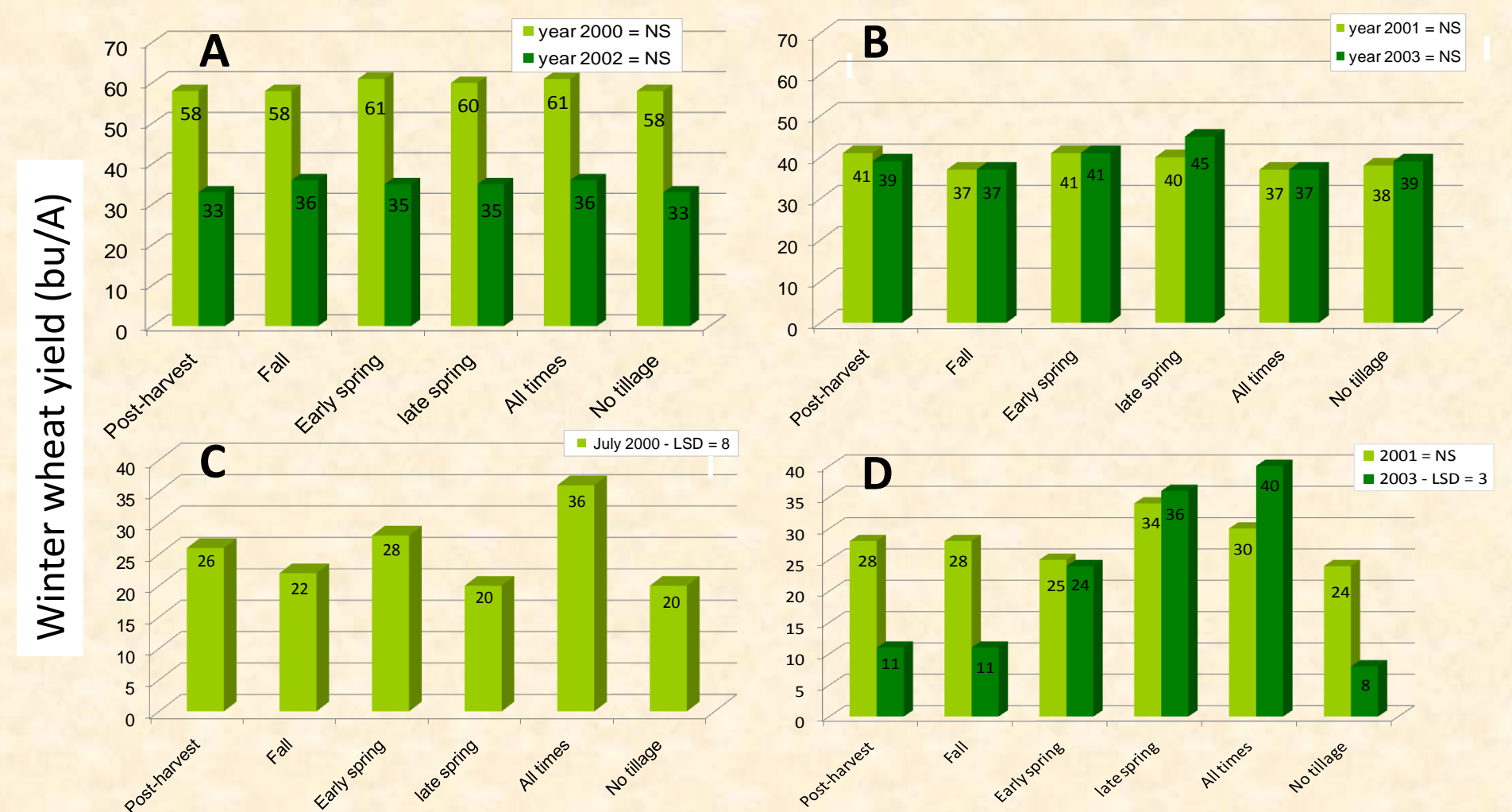
Variations in growing season precipitation resulted in variations in JGG tiller density in wheat (Figure 1) and in wheat yield (Figure 2). At the Oregon sites, post-harvest tillage immediately after harvest or in the fall reduced JGG in the subsequent wheat crop in 1 of 4 years (Figure 1B, 2001). This trend was also evident in another year, but not at a significant level (Figure 1B, 2003). However, JGG density differences at these sites did not affect wheat yield (Figure 2B). Post-harvest tillage did not affect wheat yields in any year at the Oregon sites (Figures 2A and 2B). At the Utah sites, post-harvest tillage had no effect on JGG tiller density in wheat (Figures 1C and 1D). Differences in winter wheat yields at the Utah sites (Figures 2C and 2D) were more likely the result of tillage effects on growing season soil moisture rather than JGG density (data not shown).

Figure 1. Effects of post-harvest wheat stubble tillage timing on late-season jointed goatgrass tiller density in subsequent winter wheat crops.



A= Oregon site #1 (2000 and 2002); **B=** Oregon site#2 (2001 and 2003)
C= Utah site #1 (2000); **D=** Utah site#2 (2001 and 2003)

Figure 2. Effects of post-harvest stubble tillage treatments on subsequent winter wheat yields over two winter wheat-fallow cycles.



Conclusions: There are instances where JGG density in fallow and in subsequent wheat crops may be reduced by post-harvest disking in some years, but will be dependent on precipitation before and/or after tillage. Recommending post-harvest tillage for JGG management will likely produce inconsistent results. Post-harvest tillage may have the negative effect of reducing wheat crop residue, thereby increasing the potential for soil erosion.