SEEDLING EMERGENCE OF ROW CROPS AND WEEDS ACROSS FIVE TILLAGE SYSTEMS.
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Adoption of reduced tillage in the north central region of the United States has lagged behind adoption rates in other regions. One reason for this lag is that if soils in the north central region are not tilled, they remain cold and wet in spring, which delays access to fields and, thereby, delays planting and increases probabilities of low crop yields. New equipment and residue management systems may help alleviate these problems. However, effects of these new systems on weed and crop emergence rates and densities are not known well. Consequently, we examined the above variables for three row crops (corn, soybean, and sunflower), five tillage systems (moldboard plow, MP; chisel plow; deep strip till, STd; shallow strip till; and no-till, NT), and (for weeds) three micro-sites (crop row, interrow with wheel tracks, and interrow without wheel tracks) during 2004 and 2005 in a loam soil in Minnesota. Primary weeds were green foxtail, common lambsquarters, and wild mustard. Foxtail tolerated all tillage systems, preferred rows in reduced tillage systems, and emerged faster in plowed soils. Lambsquarters preferred plowed soils, tolerated reduced tillage systems, and emerged slightly faster in MP. Mustard was entirely restricted to plowed soils, especially MP. Sunflower performed consistently well in STd and inconsistently elsewhere. Soybean was relatively insensitive to tillage and performed consistently well in reduced tillage. Corn was sensitive to NT but, otherwise, was not affected by tillage. All crops tended to emerge faster as tillage intensity increased, and emergence in STd often was similar to that in plowed soils (except corn in 2004). Overall, MP remains unique among the tested management systems, but a system like STd may be an acceptable alternative in terms of crop stand and rate of crop emergence. Delayed emergence of some weeds in STd may require use of PRE + POST or split POST herbicide strategies. Fortunately, STd is inhospitable to other weeds, like wild mustard.

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