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EVALUATION OF VARIOUS SOIL TILLAGE METHODS IN TERMS OF PERCENT CROP RESIDUE COVER AND EROSION CONTROL

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Abstract

The aim of this study was to estimate the percent crop residue cover remaining on the soil surface after field operations with various soil tillage methods on wheat, barley, oats and rye fields and evaluate these methods in terms of soil erosion control. Tillage methods were mainly formed as fall tillage, fallow and spring tillage. Six tillage implements including mouldboard plough, disc plough, rotary tiller, one-way disc plough, chisel plough with sweeps and paraplough were selected for fall tillage and three tillage implements including heavy disc harrow, light disc harrow and harrow with spike tooth were selected for spring tillage. Totally, 42 of soil tillage methods were formed using these implements. The percent crop residue cover before tillage were determined by using a regression equation which gives the relationship between the amount of crop residue (kg ha^{-1}) and the percent crop residue cover. The percent crop residue cover after tillage operation was predicted by using calculation method. Tillage methods providing more than 20% of crop residue cover were accepted as sufficient for soil erosion control. Research results showed that percent crop residue cover remaining on the soil surface after tillage operation is ≤ 21.99% for method 11-16, ≤ 42.51% for method 21-26, between 14.64% to 59.07% for method 31-36, between 18.59% to 63.02% for method 41-46, between 40.90% to 85.33% for method 51-56, between 42.59% to 87.03% for method 61-66 and between 45.71% to 90.14% for method 71-76. Method 11-16 used on barley field, method 11-13 used on wheat field and method 11-12 used on rye field were evaluated as the most unsuccessful methods, whereas method 76 used on oats field was evaluated as the most successful method in terms of soil erosion control.

Keywords: *Percent crop residue cover, Calculation method, Soil tillage methods, Erosion.*