

Where can crop residue be harvested sustainably in southern Ontario?

By Ian McCormick

In Ontario, the southern region has the greatest potential for sustainable harvest of crop residues. Annualized yields could average as high as 3928.7 kg/ha/yr in corn-soy rotations and 5024.2 kg/ha/yr in corn-soy-wheat rotations (Kludze et al. 2010). However, more realistic yields based on county averages range between 78-1033 kg/ha/yr for corn-soy and 63-1222.6 kg/ha/yr for corn-soy-wheat rotation (Kludze et al. 2010).

To cover costs a farmer would probably need a sustainable residue removal (SRR) rate of at least 500 kg/ha/yr (Kludze et al. 2010). Table 1 below shows average annualized sustainable residue removal (SRR) rates for all southern Ontario counties. Corn-soy and corn-soy-wheat rotations are shown with the average SRR harvest potential and the percent of county land that could sustain these SRR harvests.

These estimates are based on data gathered at the University of Guelph's Elora Research Station and serve only as a guideline. Actual farm conditions will vary depending on factors such as existing soil organic matter dynamics and crop yields ((see "**Determining how much crop residue to remove on your farm**" for more detail). Thus, these numbers are estimates and site-specific conditions may allow much more or much less SRR.

Table 1: Sustainably available crop residues in southern Ontario (*RES_{min}=11,126kg/ha/yr) (Kludze et al. 2010)

County/Division	Corn-Soybean		Corn-Soybean-Wheat		Total SRR based on land area distribution under rotation types (tDM/yr)
	Average SRR (kg/ha/yr)	Qualified Land Area (%)	Average SRR (kg/ha/yr)	Qualified Land Area (%)	
Brant	300.8	19.0	366.1	22	11,103
Chatham-Kent	1033.1	46.1	1143.5	49	148,470
Elgin	577.8	31.1	711.2	36	54,284
Essex	359.7	21.8	465.8	27	24,240
Haldimand-Norfolk	188.8	13.0	180.2	13	12,450
Hamilton	169.7	11.9	193.2	13	3,614
Lambton	723.2	36.4	844.9	40	95,091
Middlesex	760.9	37.7	997.5	45	127,799
Niagara Regional	78.0	6.2	63.0	5	1,738
Oxford	895.5	42.1	1222.6	51	78,764

* Note: Data gathered from silt loam soils at the Elora Research Station indicated that 11,126 kg/ha/yr (**RES_{min}**) of residue must be returned to the soil to maintain soil health.

Final note: It is estimated that to break-even a farmer must receive payment of \$57-87 per ton of harvested residue (Kludze et al 2010). To minimize these costs higher harvests per acre are necessary.

Widespread SRR is likely only possible on counties with high SRR harvest potential and a relatively high percentage of qualified land. Based on these estimates, it seems likely that many farmers could practice SRR profitably in Chatham-Kent and Oxford counties.

Data and information from: Kludze, H., Deen, B., Weersink, A., van Acker, R., Janovicek, K., & De Laporte, A. (2010). *Assessment of the availability of agricultural biomass for heat and energy production in ontario*. Crop Science, University of Guelph: Ontario Ministry of Agriculture, Food and Rural Affairs.