



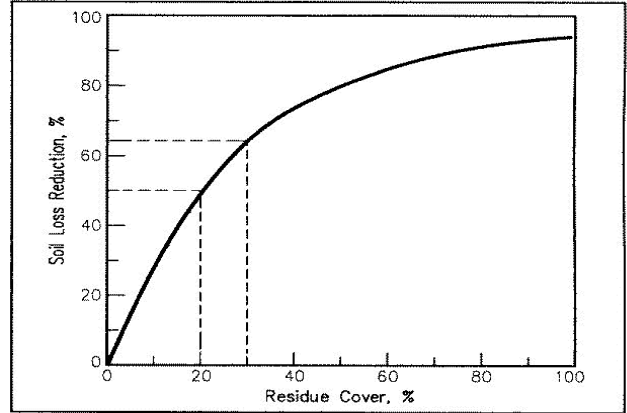
# CROP RESIDUE & TILLAGE ROUGHNESS MANAGEMENT GHG Taking Charge Team Fact Sheet



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Retained surface residue can act as a shield from the erosive effects of rainfall to dislodge soil particles. It will also assist in retaining dislodged particles within the field by the micro-dam effect residue will have on runoff. Tillage has a large impact on residue and how it is distributed vertically with tillage depth. Some forms of tillage if done too deep or too fast can bury all of the residue to deeper depths in the soil. Microbial decomposition of that residue is reduced as the majority of microbial activity is at the surface of the soil. As such, residue may take longer to be transformed into stable organic matter known as humus (sequestered carbon), which contributes to improved soil structure, drainage, moisture and nutrient retention.

Residue management in NB within the potato rotation can only benefit conservation when producers are moving from a grain crop to a potato crop. The management of this grain residue starts with grain harvest. Every effort is made to distribute straw and chaff across the cutting width of the combine. This is usually done with a straw chopper which is located to the rear of the combine. The percent of residue left on the soil surface can have a huge impact on the level of soil erosion within a field. Figure 1 depicts the reduced levels of erosion as a result of increased levels of surface residue.



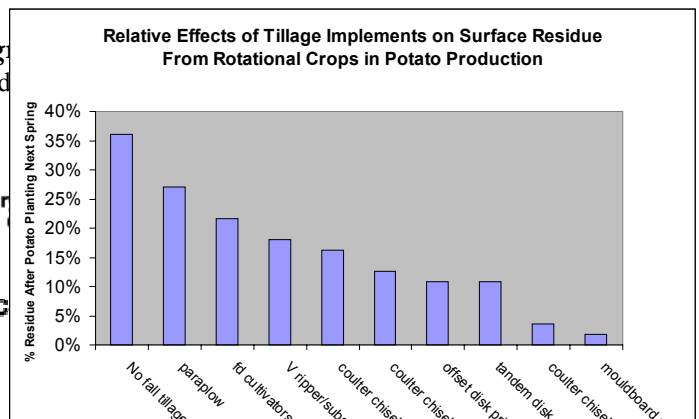
**Fig 1. Residue cover has a major impact on soil loss reduction.**

## Conservation Tillage Systems and Management, 1992

The speed, depth and number of tillage passes can also change the level of residue available to mitigate water erosion. The majority of water erosion occurs during the spring and summer months. As a result, the level left after planting can have a big impact on the erosive effects of rainfall.

Chart 1 depicts the relative effect of residue left as a result of the type of tillage used following a grain crop and entering into a potato production year. The levels of residue represent a typical field slope and grade with the primary tillage (performed at a depth of 15 cms or greater) in the fall. Chart 2 represents the corresponding potential soil loss during the growing season with choice of tillage.

Chart 1, RUSLE Calculation 2004

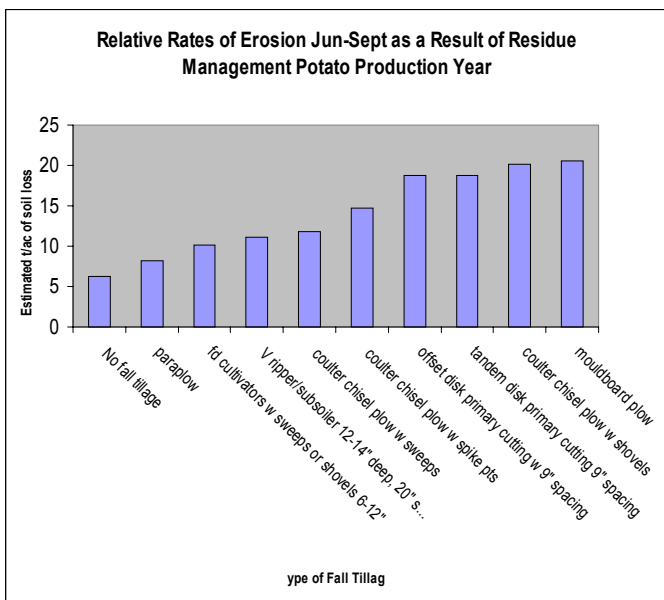


## Greenhouse Gas Mitigation Program Programme d'atténuation des gaz à effet de serre



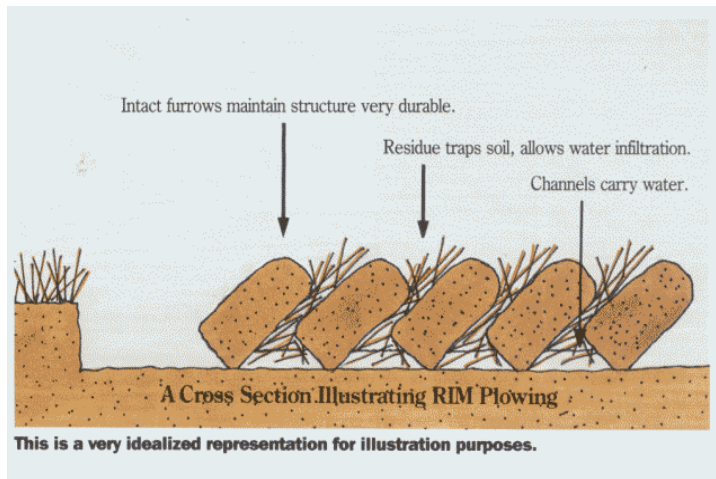
Dair

Chart 2, RUSLE Calculation 2004



As a result of technology and increased rates of potato harvest. If this can be done to encourage surface residue as well as a rougher surface across the contour of the slope, increased erosion protection can be found. Sometimes residue from a previous crop such as potatoes may be so low that surface roughness from higher ridge heights may be the only option to combat water erosion. A very common form of fall tillage in preparation for potato production the following year is the moldboard plow. The moldboard plow moves the greatest amount of soil when compared to other tillage implements. As such it tends to bury a lot of residue. Fall tillage with the moldboard plow is intended to ready the ground for early drying in the spring. If fall tillage is a must for the producer, every effort should be made to plow leaving a rough surface, with as high a ridge as possible.

Figure 2



Kverneland plow company as "Residue Inversion Management (RIM)". Note how the furrow slice of each pass with the moldboard lays the soil in stacks upon each other. To conduct this form of plowing, all trash burying accessories must be removed from the plow. The cutting width of each moldboard is narrowed to 12-14" and normal working depth is only 6-8". As well, ground speed is reduced to attaining optimum furrow height greater than 6". The combined effort of retaining residue cover and maximizing furrow height is emphasized in the chart below which shows the impact of residue and tillage roughness on erosion rates.

Chart 3, RUSLE Calculation 2004

