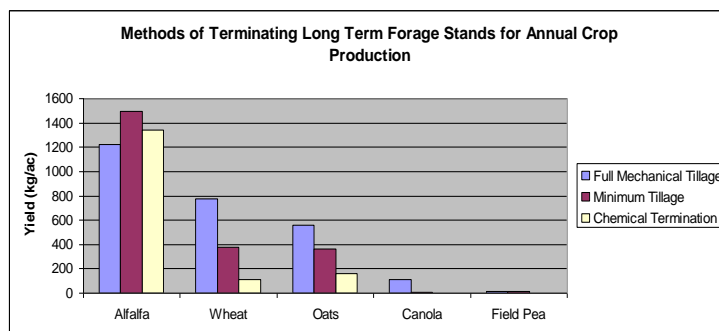


This project was set up to demonstrate various termination methods when transitioning from long term forage stands to annual crops, and to show the economic and environmental impacts associated with each termination method.

An existing alfalfa/hay field was identified near Swift Current, SK and plant growth was eradicated using three termination systems: 1) Full mechanical tillage; 2) Chemical termination; 3) Minimum Tillage (combination of chemical and mechanical tillage). In 2014, five crops were seeded across each system which included Spring Wheat, Oats, Canola, Peas, and Alfalfa. Each crop was fertilized at recommended rates and the alfalfa inoculated with Nitro Gold strain of rhizobia. The annual crops were harvested for grain yield and the alfalfa was evaluated for biomass yield.

It was difficult to terminate the alfalfa and volunteer plants grew back into all three termination systems and competed with all annual crops. This was most evident in the chemical termination system. Hot dry conditions of July, where less than an inch of rain fell at the site, compounded by the competition from the re-growth of alfalfa, severely impacted the growth of canola and peas, even though early emergence counts were good for both crops. Wheat and oats were more successful in competing with the volunteer alfalfa especially under full mechanical tillage. Yields for both cereals fell substantially under minimum tillage and chemical termination systems, where higher rates of glyphosate or more applications were needed to limit competition. Among the termination methods demonstrated,

mechanical tillage performed the best with wheat yielding 778 kg/ac and oats yielding 560 kg/ac followed by minimum tillage yields of wheat 379 kg/ac and oats 366 kg/ac. Chemical termination yields fell dramatically for both crops with wheat yielding 114 kg/ac and oats yielding 164 kg/ac. Biomass production in the plots seeded to alfalfa were higher in the minimum and chemical termination systems. This was due to the re-growth of the existing alfalfa that prevailed under those termination systems and had little to do with any new alfalfa establishment, that contributed very little to biomass. Better control of volunteer alfalfa with substantially higher rates of glyphosate and subsequent applications would significantly improve the chemical and minimum tillage termination methods, resulting in increased yields for all crops seeded into these systems.



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