

Manure and Weed Control Options



UNIVERSITY
OF MANITOBA

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BACKGROUND: The hog industry is expanding in western Canada, particularly in Manitoba where the industry is expected to double over the next decade. At the same time, producers are experiencing increasing farm expenses, mainly due to greater fertilizer and pest management input costs. Farms with both crops and livestock, and farms with crops and a nearby source of livestock manure, will benefit by integrating use of the manure resource into crop nutrient plans, thereby reducing the input costs of inorganic fertilizers. In order to benefit from manure applications, producers should have access to information quantifying the effects of manure use on weed pressures and herbicide performance.

OBJECTIVES: The objectives of this study are to quantify the effect of manure applications on (a) the number and community of weed species, (b) the timing of weed emergence, (c) herbicide efficacy during the growing season, and (d) herbicide carry-over risks from one year to the next.

SIGNIFICANCE: Using field plots and laboratory experiments, the results of this study will improve the ability of producers to develop more integrated management plans, thereby enhancing the utility and consistency of manure and weed control management planning procedures.

FIELD STUDY

This study component is carried out on three different soil types at the Carman Research Station of the Faculty of Agricultural and Food Sciences, University of Manitoba, Canada. Soils are a Hochfeld fine sandy loam, a Rignold loam, and a Winkler clay.

For each soil type, the experiment is a randomized block design with 5 Nitrogen (N) treatments and 4 replicates per treatment:

- Manure applied at recommended N-rate*;
- Manure applied at twice the recommended N-rate;
- Urea (46-0-0) applied at recommended N-rate;
- Urea (46-0-0) at twice the recommended N-rate; and
- No fertilizer applied.

* N-requirements are based on soil and manure tests, and a yield goal (canola crop) of 35 bu/ac; Manure and urea were broadcasted and incorporated within 24 hours; Additional commercial fertilizers were applied for balanced crop nutrition.

Measurements on each plot (32 m²) include (1) monitoring the persistence of trifluralin (Treflan EC) in soil for a duration of 1 year; (2) assessing crop injury risks due to carry-over of trifluralin from one year to the next; and (3) quantifying the number and community of weed species, as well as the timing of weed emergence, relative to the crop.



PHOTO's

Applying 1392 gallons of manure
onto research plots: by hand!



LABORATORY STUDY

Soil samples are being collected throughout Manitoba from agricultural fields that have received manure for a different length of time, ranging from 1 to 40 years. For each field, soil samples are also being collected from adjacent agricultural fields that did not receive manure (control).

Each soil sample is split with one-half receiving additional manure and the other-half receiving no amendments prior to herbicide applications. As such, we will be able to compare herbicide persistence in soils that have received different amounts of manure in the past, as well as to quantify, for each soil, how a one-time manure application prior to herbicide spraying may influence the persistence of herbicides in soil.

Herbicides investigated are trifluralin (Treflan EC) and glyphosate (Roundup).

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