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# Effect of Re-cropping Infested Wheat Stubble on Wheat Stem Sawfly Survivorship.

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**Key Words:** wheat stem sawfly, wheat, residue management, seeding system, re-cropping.

## Introduction

The use of solid-stemmed cultivars is the most effective strategy when managing wheat stem sawfly damage. However, there are only three cultivars available, and all three are in the CWRS class. All other classes of wheat including durum do not carry any resistance. Therefore, management options in addition to solid-stemmed wheat must be explored. Conservation cropping practices have allowed producers in semi-arid regions to increase continuous cropped acres vs. the traditional half cropped/half fallow system. We were therefore interested to determine what impact re-cropping infested wheat stubble, as opposed to leaving the stubble as fallow, would have on wheat stem sawfly survivorship.

## Materials and Methods

Split Plot Factorial Design:

Main Plot: pre-seed residue management – spring wheat stubble infested with sawfly

- 1) Heavy tine setting 20°,
- 2) Heavy tine setting 5°,
- 3) Phoenix rotary setting 25°,
- 4) Phoenix rotary setting 45°,
- 5) Control-no pre-seed residue management

Sub Plot: Direct Seeding System:

- 1) ConservaPak 9” row spacing w/knife opener,
- 2) ConservaPak 9” row spacing with 11” sweep,
- 3) ConservaPak 12” row spacing w/knife opener,
- 4) JD Disc Opener with Flexicoil seed distribution,
- 5) Chem fallow-no re-cropping.

Pre-assessment of live larva

- 60 cm of stubble row excavated at 5 points in main plot
- Adult emergence
  - 1 m x 1m emergence cage placed in each of the 75 plots

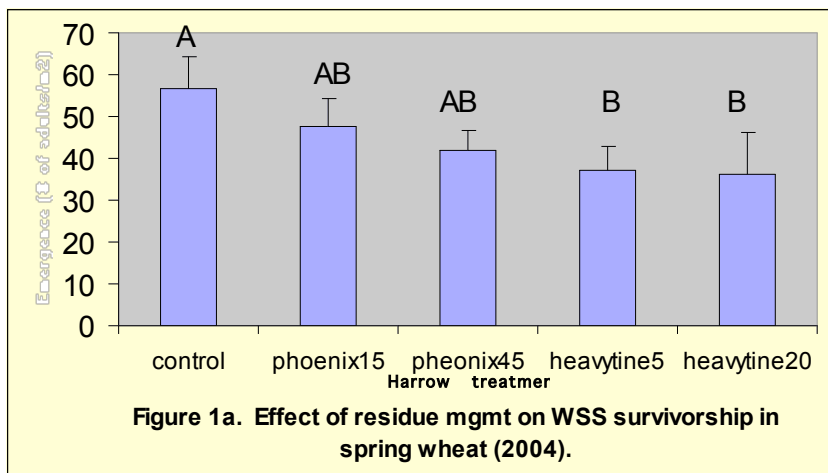
- Any plant material in cage was eliminated with glyphosate prior to sawfly emergence.
- # of adults counted in cages 3x/wk throughout sawfly cycle.

Timing of treatment: Winter wheat (stacked behind spring wheat) vs. Spring wheat (AC Barrie).

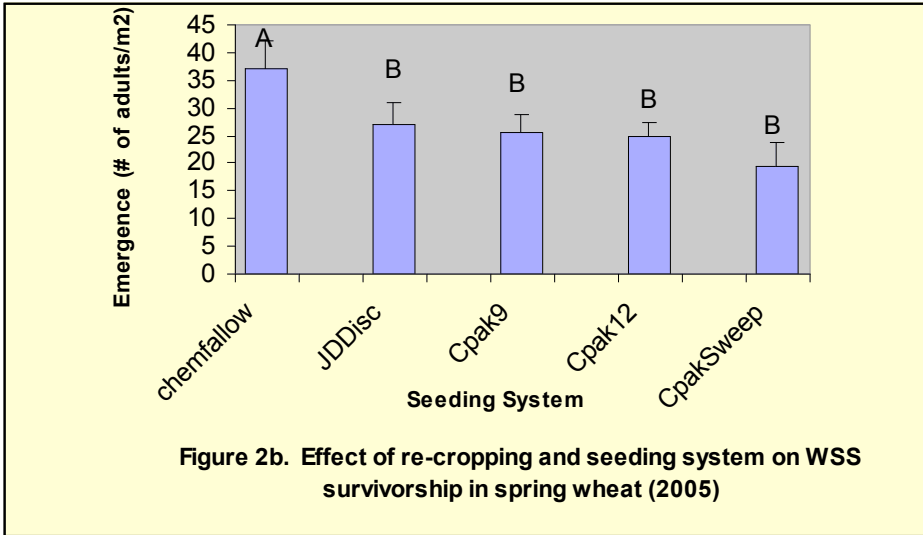
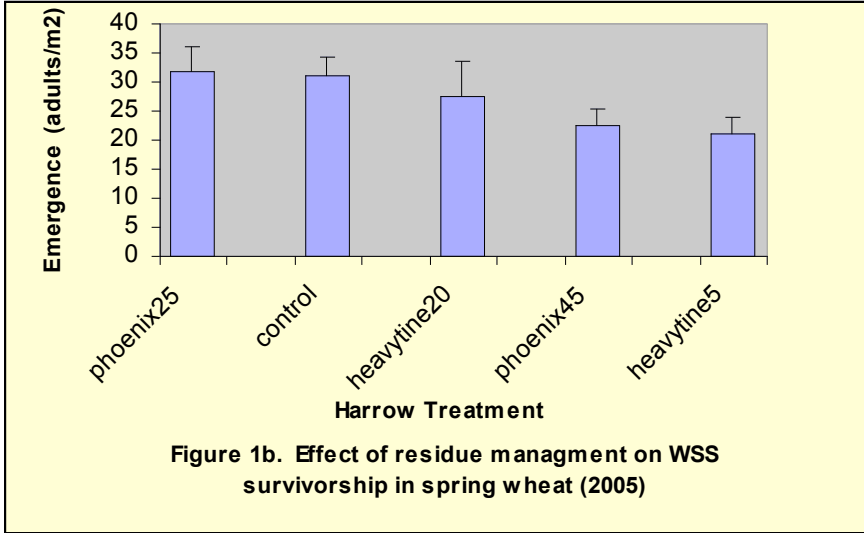
Total of 25 plots x 3 replicates grown in spring and winter wheat system

### Results and Discussion

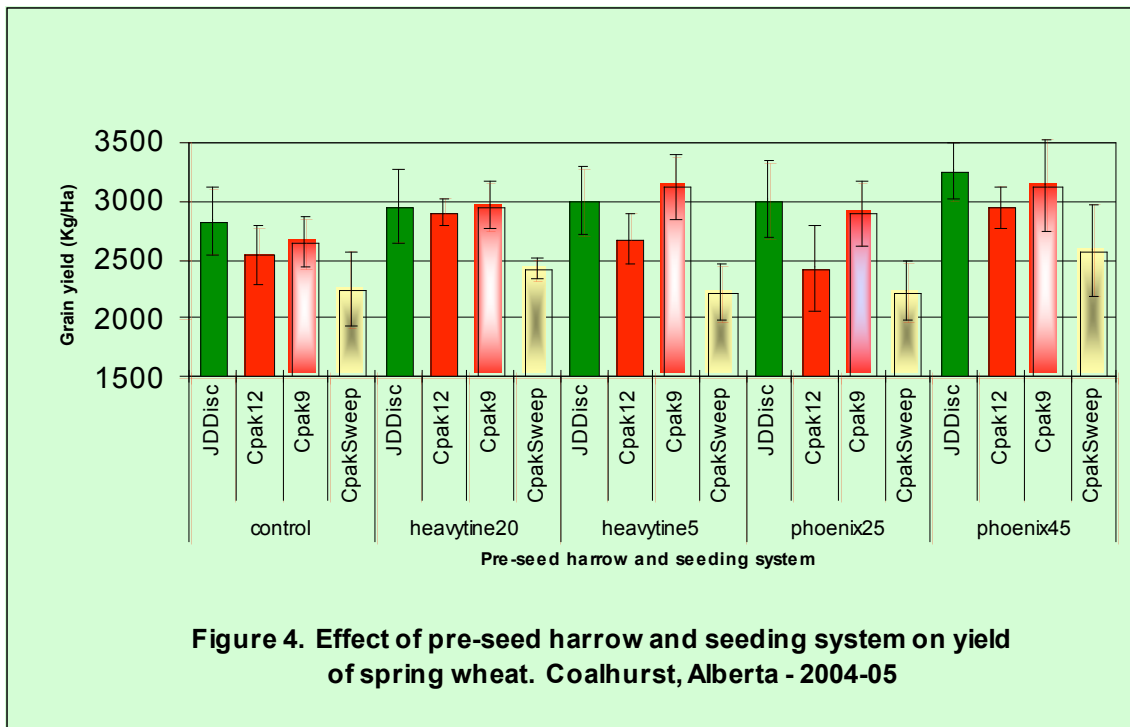
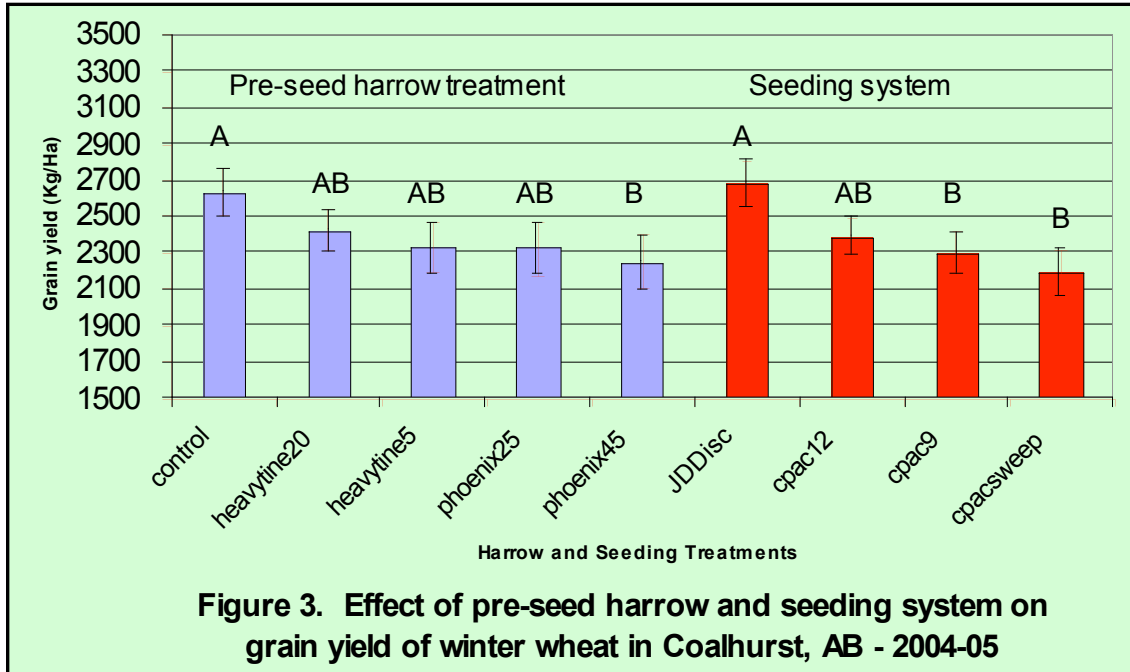
Heavy harrow residue management significantly reduced the adult population compared to leaving the stubble undisturbed prior to seeding (Fig. 1). The result of the seeding system factor demonstrates that re-cropping infested stubble significantly reduces adult populations compared to leaving the infested stubble as chem-fallow (Fig. 2). However, the pre-seed harrow treatment in the winter wheat system reduced grain yield, therefore, residue management for control of sawfly in a winter wheat system may not sustainable (Fig. 3). Grain yield in the spring wheat system was not negatively affected by the pre-seed harrow and yield did not differ significantly between seeding systems (Fig. 4).



Means not sharing letters are significantly different P=0.05 (LSD t-Test)



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**Conclusions**

- Re-cropping significantly reduced sawfly emergence vs. leaving the infested stubble field as fallow. However, the reduction is incremental and must be used

in conjunction with other management options such as solid-stem varieties and diverse rotations.

- No significant difference in sawfly emergence detected between the seeder configurations ie. disc opener vs. knife.
- Pre-seed harrow treatments to manage sawfly damage recommended for a spring system only - most effective implement - 5° Setting on heavy tine harrow.
- No significant difference in parasitoid #'s detected but greater numbers observed in treatments where stubble was left undisturbed

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