

Rotary Hoeing in Organic Oats

- Darren Fehr (Rolfe) and Dan Wilson (Paullina) were 2016 cooperators helping to examine the effect of rotary hoeing (RH) on:
 - ✓ oat yield and test weight (farmer-recorded harvest numbers)
 - ✓ oat and weed populations (early season counts before/after RH)
 - ✓ weed biomass and composition (samples taken at soft dough stage)

- Oats were planted with a desired population of 29 plants/ft². The following equation was used to calibrate the planting rates:

$$\text{Desired Planting Rate } \left(\frac{\text{lb.}}{\text{acre}} \right) = \frac{\text{Desired Plant Stand} \div (1 - \text{expected loss}(\%))}{\frac{\text{Seeds}}{\text{lb.}} \times \text{PLS}}$$

PLS = Pure Live Seed

(Expected loss = 25%, greater than normal)
Adapted from Wiersma et al., 2010

- Oats were rotary hoed at the 1-2 leaf stage with two passes occurring sequential over a two day period (2 passes total with the RH @ 10mph per pass).

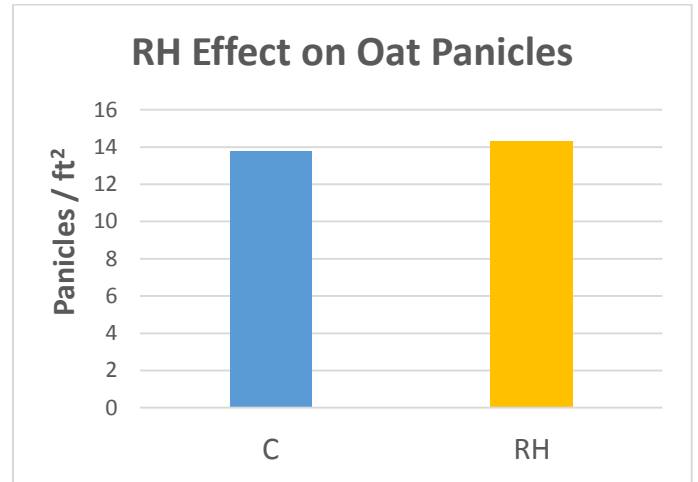
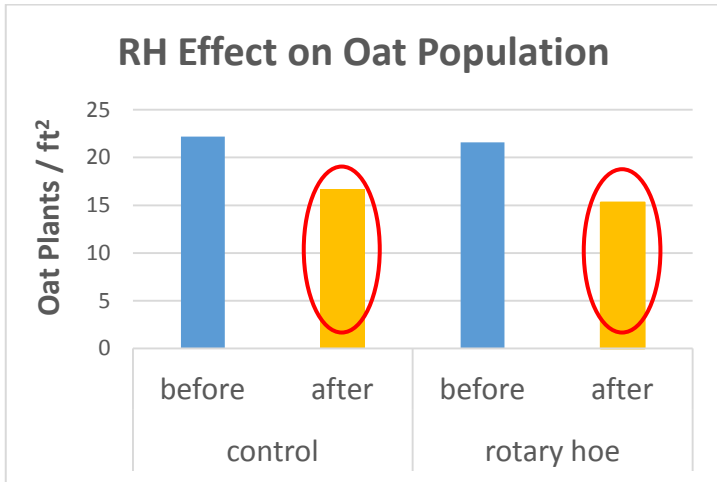
Farmer	Planting Date	RH dates	Late-Season Sampling	Harvest Date
Fehr	4/13	5/6, 5/7	7/5	7/25
Wilson	4/8	5/5, 5/6	7/5	7/22 <small>*Swathed 7/21</small>

Results

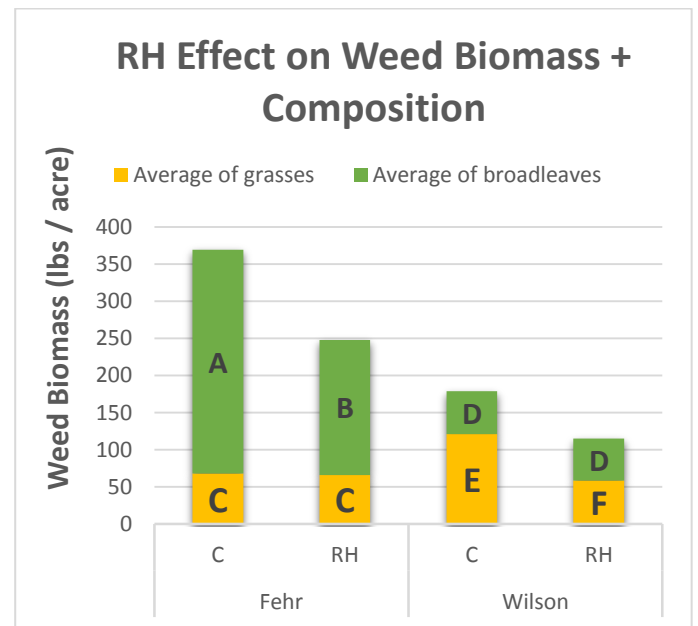
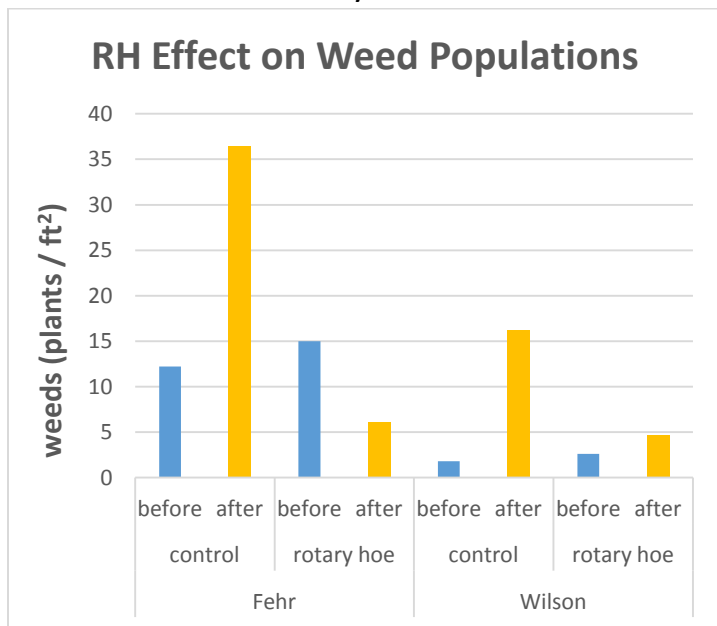
- At Wilson’s farm there were no statistical differences between the control and RH treatments for **Yield** or **Test Weight**.

Treatment	Rotary Hoed	Control
Yield	115 bu. / acre	109 bu. / acre
Test Weight	32 lbs. / bu.	32 lbs. / bu.

- There were no differences in either oat plant populations or panicles / ft² between RH and control treatments.



- Rotary hoeing did have an effect on weed populations, weed biomass and its composition but in different ways on the two farms.



What is the value of reducing weed populations even if yield is unaffected?

Farmer	Weeds reduced by RH	Weeds not reduced by RH
Wilson	Yellow foxtail (6500 seeds/plant)	Cocklebur (900 seeds/plant)
Fehr	Smartweed (19,500 seeds/plant)	Giant ragweed (10,300 seeds/plant)

Adapted from Renner, 2000