# 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:

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

$$PLS = Pure\ Live\ Seed$$

(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 *Swathed 7/21 |

## 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. |

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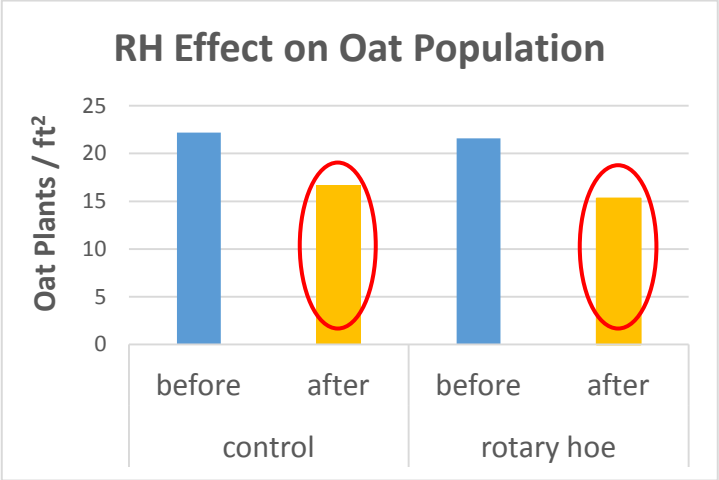
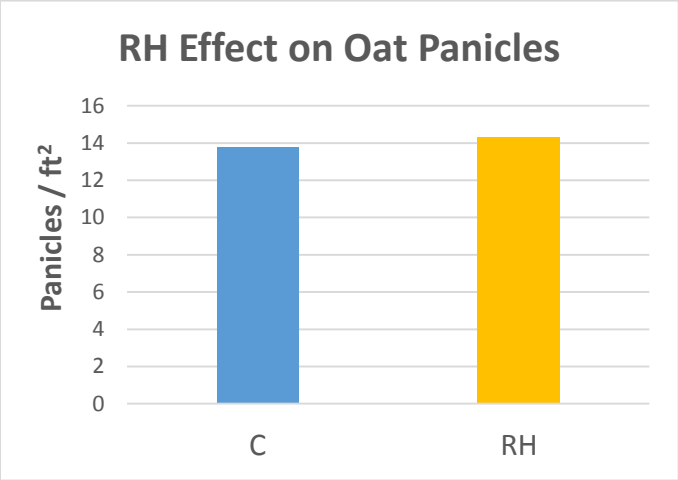
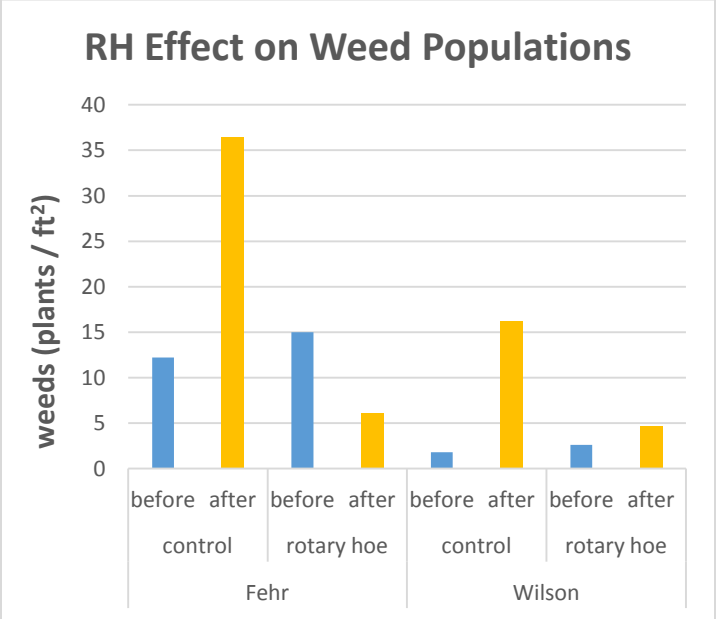
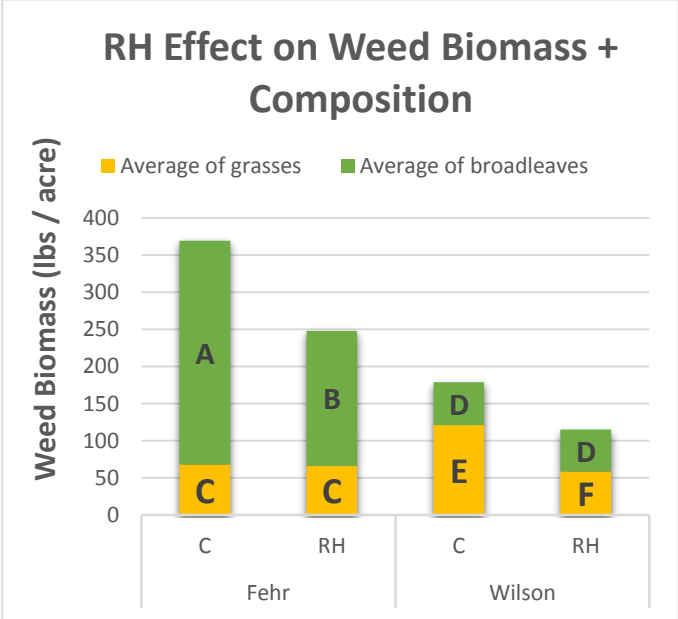
- There were no differences in either oat plant populations or panicles / $ft^2$ between RH and control treatments.




- 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

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