



**RESEARCH
 PROTOCOLS**

Tine Weeding Oats

Objective: Determine the effect on weed pressure, intercropped red clover and oat yield from tine-weeding oats in an organic production system.

Hypothesis: Tine-weeding oats prior to interseeding red clover will reduce weed pressure, improve oat yield and have no effect on intercropped red clover biomass production compared to co-seeding oats and clover and no tine-weeding.

Farmer-Cooperator will:

- Follow Research Protocols in accordance with Project Design, Data to Collect, Photo List and Timeline detailed below.
- Take photos throughout the project. Try to capture photos that depict the differences you observe among the treatments.
- Keep in contact with PFI with updates and questions.
- Turn in data and complete post-project survey by November 2020.

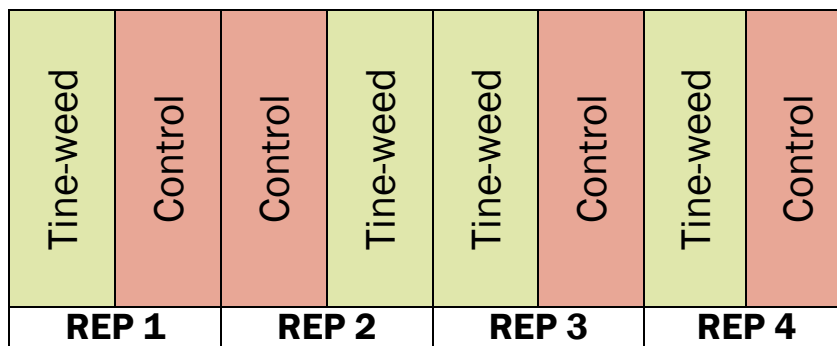
Practical Farmers of Iowa will:

- Help set up research protocol, monitor progress of project and provide support when needed.
- Publish results in a PFI research report, on PFI website and potentially other outlets.
- Provide \$550 research honorarium to cooperator upon receipt of data.

Project Design:

Treatment	Description
Tine-weed	Plant oats. Make two tine harrow passes and interseed red clover on second pass.
Control	Plant oats and red clover at same time. No tine harrow passes.

- Apply these 2 treatments in a randomized, replicated trial: at least four replications of randomized paired strips. 2 treatments x 4 replications = 8 strips total.
- Strips must be at least as wide as one combine pass and should run the length of the field.
 - Example layout:



Data to Collect (cooperator):

- Weed assessment (density and/or biomass; on same date if assessing both)
 - DENSITY: In late spring/early summer, count and record number of weeds in a 3-ft radius at seven random points along a 100-pace transect through the center of each strip.
 - BIOMASS: In late spring/early summer, sample aboveground weed growth from each strip.
 - Randomly place 1’x1’ PVC square in strip
 - Use shears to clip all aboveground plant material from within the square
 - Place all plant material from a single square into one paper bag
 - Label paper bags accordingly
 - Rep #
 - Treatment: Tine-weed or control
 - Number of squares sampled from (e.g., 1 square = 1 ft²)
 - Date of collection
 - Optional: Repeat this process 2-3 times per strip
 - (e.g., 2-3 paper bags per strip)
 - Send paper bags to PFI office
 - Samples will be dried and weighed
- Oat yield
 - Harvest and record grain yield and moisture from each strip.
- Red clover biomass
 - In fall, sample aboveground biomass from each strip.
 - Randomly place 1’x1’ PVC square in strip
 - Use shears to clip all aboveground plant material from within the square
 - Place all plant material from a single square into one paper bag
 - Label paper bags accordingly
 - Rep #
 - Treatment: Tine-weed or control
 - Number of squares sampled from (e.g., 1 square = 1 ft²)
 - Date of collection
 - Optional: Repeat this process 2-3 times per strip
 - (e.g., 2-3 paper bags per strip)
 - Send paper bags to PFI office
 - Samples will be dried and weighed and, pending funding, will be sent for lab analysis (C and N concentration).

Photo List (cooperator):

- Tine harrow passes; equipment in field
- Oats + red clover growing together (throughout season).
- Cooperator collecting data.
- Cooperator in field trial.

Project Timeline:

Spring	Summer	Fall
<ul style="list-style-type: none"> • Plant oats to entire field. <ul style="list-style-type: none"> ○ Co-seed clover to ‘Control’ strips • Make two tine harrow passes in ‘Tine-weed’ strips. <ul style="list-style-type: none"> ○ Interseed red clover on second tine harrow pass. • Take photos. 	<ul style="list-style-type: none"> • Conduct weed assessment • Harvest oats from all strips • Take photos. 	<ul style="list-style-type: none"> • Collect red clover biomass from all strips. • Turn in data. • Take post-project survey.

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The terms of this Research Protocols document are subject to the terms of the individual Research Cooperator’s Memorandum of Understanding agreement with PFI. To the extent these terms may differ or conflict, the Memorandum of Understanding shall control.