PRACTICAL FARMERS OF IOWA
COOPERATORS' PROGRAM Farmer-Led Research

RESEARCH PROTOCOLS

Evaluating Methods to Reduce Soil Compaction in Till and No-Till Beds with a Brassica Crop

Objective: Compare the two methods (double-digging and compost/mineral amendments) to reduce soil compaction and improve broccoli yield in till- and no-till beds. Control plots in till and no-till will also be compared.

Hypothesis: We expect double-digging to reduce compaction in the till bed, but with a high labor cost. We expect the no-till control plots to have lower compaction than the control-till plots, but do not expect to see a difference in the no-till plots with added mineral supplements.

Farmer-Cooperator will:

- Follow Research Protocols for study
- Take photos throughout the project
- Keep in contact with PFI with updates and questions
- Turn in all data 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 cooperator payment at conclusion of project year.

Project Design:

- The farmer will establish till and no-till beds.
- Each bed will have 4 control plots and 4 treatment plots (16 plots across both beds).
    - Till control: standard roto-till; transplant crop.
    - Till double-dig: Double-dig plots to 14 in., using "scoop and move" method; transplant crop.
    - No-till control: Maintain mulch over bed; use dibble hole to transplant.
    - No-till power mix: Same as no-till control but with additional compost and mineral added during transplant or broadcasted over plot.
- Penetrometer data, bulk density data, and yield data will be collected by plot.

Layout example for the soil compaction reduction trial in till- and no-till beds.

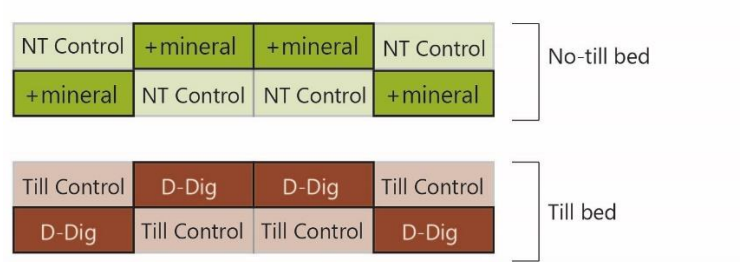

Photo List

- early-season field-shot of trial
- photos of field prep process for each treatment (ex. Double digging, hole-transplanting)
- mid-season field-shot of trial
- groups of fruit during harvest, in bins, etc.
- harvest-time with farmer in the photo, in pruned and un-pruned plots
- bonus for photo of farmer entering data in the field!

Data Collected

- Crop production and trial design information
- Collect penetrometer and bulk density data twice during the trial: collect baseline data prior to any tilling/treatments; collect again during or just after broccoli harvest.
- Harvest data by plot: marketable fruit count, weight, number of surviving plants/plot.

Project Timeline

• Review research protocol • Complete MOU and pre-project survey
April • Layout in fields for plots • Seed broccoli for transplant May • Take baseline compaction data (penetrometer and bulk density) in each plot. June • Prepare beds, transplant broccoli. September - October • Keep harvest records by plot, in accordance with datasheet • Take final penetrometer and bulk density tests.
• Enter data and photos (see photo shot list, above), to PFI's google site: https://sites.google.com/practicalfarmers.org/research/home. • Complete post-project survey.

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