2017 ACORN Conference & Trade Show
Best Western Glengarry - Truro, NS

Workshop Title:
Effective On-farm Research for Organic Field Crop Producers

Speaker:
Dr. Stefan Gailans, Research and Field Crops Director, Practical Farmers of Iowa

Executive Summary:
Dr. Gailans overviewed the Practical Farmers of Iowa as an organization, why it is worthwhile for farmers to do their own on-farm research, and how to conduct the research and gain quality results.

Detailed Notes:
The foundation of on-farm research is the Scientific Method - a cyclical process of identifying a hypothesis, designing an experiment, evaluating results, reaching conclusions, and developing next questions/hypotheses.

Think about what you, the grower, are curious about in your own operation. On-farm researchers are farmers who are inherently curious…how is it that you would do things differently? Build questions then look for answers.

Practical Farmers of Iowa (PFI):
- PFI is a farmer led non-profit organization with a shared vision of diverse farms, vibrant communities, and healthy food
- Value welcoming everyone; members police themselves on politics etc and focus on shared goals
- Multiple program areas
- Farmers host field days
- Mission: strengthening farms and communities through farmer-led investigation and information sharing

Cooperators' Program:
- PFI has supported on-farm research since 1987
- On-farm research: the mechanism through which farmers have tried to answer questions on their own farms (ex. "How can I reduce inputs?"), and sharing their learnings with others
- Farmers see their own on-farm research as being valuable in 'Ground truthing' others' research: Does the research that is out there apply to my farm and it's climate, soil etc.?
- The research tends to follow many major themes that rotate in trend: cover crops and grazing cover crops have been in focus recently

Cooperators Meeting:

- Annual 2-day meeting to get ready for next year
- Farmers from previous year present on what they did, what they found out, and what they are curious about now
- They then identify knowledge gaps and new projects
- Farmers give help to design the trials, then they implement new trials on-farm
- They then come back to the cooperators meeting to present on the past year's findings

How To Conduct On-Farm Research:

- On-farm research involves designed experiments that are scientifically vigorous
  1) treatments have to be applied to experimental units (strips or plots)
  2) Data collected from the experimental units

Selecting Treatments:

- Start practical:
  - Do you have the equipment? Is it going to cost me too much in money or time?
  - Are you going to have to rearrange your production schedule to make this experiment happen?

What To Measure:

- What do I want to know? Is it yield, biomass, weed pressure?
- Can I do that accurately, with precision? Is it going to cost me in time or money to count that?

Characteristics of Good Design:

- Replication, randomization, and design control
- Fields or rows don't tend to grow uniformly, so just growing 2 things side by side isn't going to give you accurate enough data

Spatial Variability:

- Gives you better data and takes into account the differences in growing conditions in different areas of the field

Starting with a question or questions:

- How much fertilizer or manure? What variety should I use?

Consult sources of information:

- Local universities, ag extension: Has anyone tried this? Can a study be found?

- Ask local farmers: Has anyone tried it? How did it work out? What additional questions did they come up with?

Example - Rolling Cover Crop Trial:

- Growing soybeans after roller crimping a cover crop (in this case, cereal rye)
- Will it provide sufficient weed control? And does the row width of my soybeans matter?
- I've heard this working in other states, could this work here?
- Random placing of 15 inch and 7.5 inch rows throughout field

Taking good records:

- What are the things that you would want to know?
- From previous data, is there anything you do, or would do differently? (see chart on slide)
- Harvest strips separately and get your data (see chart for how to differentiate data). Note: Was there hail damage or other extraordinary events that might have impacted the yield?

Yields by Rep and Row-Width Averages:

- What you want is to be able to record the info from the different strips, and generate a mean number
- A T test is a simple tool in Excel to look at how the two different mean numbers are statistically different. This is where an ag extension person or university person can help to get accuracy.
- If you want to figure out how to run T-Tests yourself, check out: "How to do a T-Test in Microsoft Excel" on YouTube

Pepper variety trial should read soybean:

- The plant stands was significant
- The conclusions showed that with one row width there was poorer planter penetration, seed to soil contact etc.
- Farmer can then go on to share what happened, then come up with next thoughts on what they want to try

Practical Farmers:

- Share the data on website
- Help them write the report that is scientifically sound, but very readable to farmers
- The first time we do anything may not bring the best yields

On-farm researchers value the experience:

- Farmers can either determine a new method or eliminate an idea as workable for their farm
- "You can't buy the answers in a bag"- Dick Thompson, PFI co-founder
- If it means a lot to your farm, you need to figure out what will work for you

Q&A:

Q) Soybean trial: farmer looked at different row width (7.5 vs 15 inch rows) - was the crimped cover crop also a second treatment variable?
A) Just the row width-having more than one variable is more complex and time consuming to get accurate data

Q) Do you work for the organization, or a university
A) Trained by and work experience with the university, but no longer directly affiliated. Now work directly for PFI non-profit.

Q) Are you using experimental-sized equipment?
A) Farmers are using their own equipment (or what they can borrow). Best results are taking the very centre of each strip, leaving the edges, and cleaning them up later.

Q) How is PFI funded?
A) Member-based organization that collects annual dues from the 3000 members, but also grant writing-currently over 40 funding sources that are taken care of by a funding manager. Fourteen office staff. Grants are applied for based on what the members indicate are issues/priorities.

Q) What is the active membership?
A) Smaller fraction of the 3000 - about 50 that participate in research, about 200 that host field days…will cycle from year to year. A lot of members participate in gatherings etc.

Q) What percentage are organic growers?
A) Don't remember off-hand. A lot of founding members were conventional, then became organic through research showing that they could reduce inputs. More requests for field days or training re: transitioning to organic, or mechanical weeding vs. chemical weeding.

Q) What is the scale of farmers and how do you deal with distance between 3000 acres or 300 acres?
A) Connect with folks in the area as much as possible. One of the early principles was 'we want to put numbers and data to these things we are reading about or hearing about'.

Q) Iowa is a big place with a range of soil types: how much more do you learn by doing these trials compared to reading a Rodale report? There is so much research going on all over…

A) We might know it works here, but this farmer hasn't done it yet. Am I comfortable with the application of the idea on my farm, and how I have to shift my planting practices to accommodate this new method?

Q) In applying for grants, is it hard to get money when it is research has already been done elsewhere?
A) If we are good at explaining the importance of local farmers knowing it could work for them, not just where the report was done in Pennsylvania or Ohio.