Western Illinois University
SCHOOL OF AGRICULTURE

FAQ about the Allison Organic Research Farm

How did WIU become involved with the Allison farm?

A WIU agriculture business instructor sought out land near Macomb that was pesticide-free because the chair of the Agriculture department requested a search. The department chair at the time had previously been a USDA Agricultural Research Service program leader and wanted WIU to be well positioned to conduct research related to Low Input Sustainable Agriculture, the USDA's new focus area in the late 1980s.

Who owned the land and how was the land managed?

The WIU/Allison Organic Research Farm was owned by Marion and Pauline Allison when it was first identified as a research site. In the late 1980's, when Mr. Allison was asked by a WIU faculty member why he didn't use pesticides, he responded with the question "Do you take drugs?" The faculty member said "No." Mr. Allison then said "Neither does my farm." The Allison's standard crop rotation was corn-corn-oats/hay-hay-oats from 1953 until the early 1990s. Livestock were also part of the farm until the mid-1980s.

Has the farm always been pesticide-free?

Yes, with the exception of a 20 acre field that received a half-rate application of atrazine (a corn herbicide) in 1989. The first field was certified organic in 1997 and the whole farm has been certified organic since 2009.

Does WIU own the farm?

The WIU Organic Research Program cash rents the farm from Doris Foust, daughter of Marion and Pauline Allison.

What crops do you grow and how do you choose crops?

Our main crops are corn, soybeans and small grains such as wheat or oats. Typically we harvest 1-5 tractor trailer loads of these crops each season.

On several occasions when field work was delayed by wet weather, we have grown sunflowers because sunflowers can be planted as late as mid- July. In 2017, we planted sunflowers when we were not able to secure a contract for pumpkins. We grew processing pumpkins in 2015 and 2016.

Most years we grow a small amount of hay, but it is challenging to find a market for organic hay in this region, especially since we don't have storage.

We have produced a small amount (< 1 acre) of purple and gold popcorn - WIU school colors, every year since 2007. We have also produced small amounts of other specialty crops for local markets.

We choose our crops based on markets, crop rotations, and research objectives. When we were first certified organic, it was much easier to market organic soybeans than any other crop. Now, there are better markets for organic corn and small grains. Longer more diverse crop rotations generally result in better crop and soil health, but can create marketing challenges.

What types of research are conducted at the Allison farm?

After an initial phase focused on characterizing soil resources and biological communities, research at the Allison Farm has addressed basic production issues such as performance of organic crop varieties, weed control, nutrient management, equipment performance and effectiveness of commercial products.

We typically conduct about 10 replicated experiments each season as well as some demonstration plots. Most plots are large-scale (e.g., 10 to 40' x 1200') and are planted and harvested using standard farm equipment with at least 3 replications of each plot so that statistical analysis can be performed.

Recent research has included evaluation of soybean varieties and corn hybrids, cover crops, soil amendments, seed treatments, soybean planting dates and populations, tillage systems and alternative cropping systems, such as solar corridors. Soybean variety trials typically include at least 10 different certified organic or untreated & non-GMO soybean varieties supplied by companies in the Midwest region and have occurred at a different site in recent years. Cover crop studies have evaluated the growth of cover crop species/mixtures/planting methods as well as impact on following cash crops. Recent product evaluations have included biological seed treatments and organic fertilizers.

We planted our first no-till soybean plots in 2009 and have planted no-till soybean plots every year since, with the exception of 3 seasons when the cover crops (cereal rye, triticale or mixtures) were deemed inadequate to provide acceptable weed suppression. Small grains such as wheat and oats have been planted no-till on many occasions but we have not done specific comparisons of tillage effects on small grains. We have planted strip-till corn plots several times and no-till corn plots one time (2017).

In 2015, we planted processing pumpkins at the farm for the first time and conducted 2 pumpkin studies in 2016.

Some studies are grant funded (often in collaboration with other institutions such as the University of IL) but others are funded by revenue from crop sales and product donations from companies. We are currently part of a collaboration with the University of IL evaluating the impact of corn breeding and soil management on corn yield, nutritional quality and soil health.

Our overall goal is to conduct large-scale practical research that will principally benefit organic grain farmers but also benefit conventional farmers who are interested in enhancing soil health, crop diversification and reduced input costs. We frequently get feedback from organic and conventional farmers indicating that they appreciate the research we are doing because it's practical and large-scale.

What have you learned from the research?

Each year our variety trials identify crop varieties that yield well in our area, which helps us, organic farmers in the Midwest region and seed companies make better seed selections.

Product evaluations have identified products such as organic N sources and corn seed treatments, (e.g., humates and mycorrhiza inoculants) that can significantly enhance yield.

No-till soybean plots have shown that no-till planting of soybeans into a strong stand of cereal rye, triticale or cover crop mixtures can provide good weed control and produce yields that equal or exceed conventional tillage system yields with the exception of 2 very dry seasons (2012 and 2018) when no-till soybeans performed very poorly. We have found periodic tillage to be necessary to control perennial weeds (e.g., bindweed, honey vine milkweed, Canada thistle, dandelions and trees) and we generally choose to do the most intensive tillage when growing corn.

We were part of a multi-year/multi-site soybean health experiment that found cover crops provided significant suppression of soil pathogens.

Precision planting of cover crops has proven to be an effective method of cover crop establishment that can benefit following crops, especially when the cover crops are grown in solar corridors and produce large amounts of biomass.

Competition for moisture between cover crops and cash crops can reduce cash crop yields during extreme drought years.

Beyond the results of specific experiments, the adoption of new technologies such as auto-steer (satellite guidance of tractors), precision planting and precision cultivation has substantially improved crop and cover crop establishment, and weed control at the Allison Farm. These types of technological improvements have allowed us to do more effective research across the farm, regardless of the specific treatments investigated.

The results of our studies are presented primarily at farmer meetings as well as through scientific meetings, on-line forums and the WIU School of Ag website.

How does one achieve reliable organic weed control?

The most important step in organic weed control is strategic crop and cover crop sequencing (potentially including fallow periods) to improve soil tilth and reduce weed pressure so that mechanical cultivation practices are effective. Also essential is

establishment of a good crop stand that emerges uniformly and rapidly ahead of weeds and has a competitive advantage over weeds that emerge after the crop. This normally involves tillage shortly before or during planting (in the case of ridge-till) to eliminate any weeds that are already growing but a strong uniform stand of a cover crop like cereal rye can also prevent weed germination in organic no-till systems. Precision planting technology and tractor guidance are very helpful in establishing a good crop stand. Selection of crop genetics with good emergence, use of biological seed treatments and banded fertility can also help with establishment of a vigorously growing crop.

After planting, blind cultivation practices like rotary hoeing and tine weeding can be very effective at reducing early weed pressure, especially when crops are planted in a furrow or when a soil crust is present. After wide-row crops are well established, row cultivation can be used to physically remove weeds in the inter-row zone and bury weeds in the row. Effective row cultivation requires good soil tilth, suitable plant size and the right tools set and operated properly.

Over the past decade, we have made major progress in controlling in-row weeds through controlled flow of soil into the row during the FIRST cultivation using an IH153 cultivator modified by Gary McDonald (2012-2021) and more recently a prototype Accuraflow cultivator (2020-2021). Additional tools, such as flame weeding and weed zapping, can be employed when soil conditions are not suitable for mechanical cultivation but we are not currently involved in this type of research.

What are the most practical methods to meet the fertility needs of organically grown crops, with and without the use of manure?

Integrated crop and livestock production (i.e., generation of manure on-farm or on a nearby farm is the easiest way to build soil fertility on an organic farm, but use of manure alone can result in excessive nutrient levels (e.g., extremely high soil phosphorus) and/or nutrient imbalances so manure should be integrated with legume cover crops whenever possible.

Organic farms that are not located near livestock facilities often purchase dried and sometimes pelletized manure products (e.g., 5-3-2 pelletized chicken litter). When manure is not an option, more intensive use of cover crops and longer crop rotations combined with strategic use of mineral inputs (e.g., micronutrients, rock phosphate or lime) can be used to build soil fertility. Low rates of expensive but concentrated N sources like Chilean nitrate (16-0-0) and Nature Safe 13-0-0 can also be used to increase N availability at critical times. These types of materials can be metered accurately and provide more predictable release of N than cheaper sources.

Can growers without livestock manures obtain adequate amounts of nitrogen for organic production?

It's more challenging, but it can be done with legume cover crops such as alfalfa, clovers, or peas and non-manure based organic fertilizers. At the Allison Farm, we use modest rates of

animal manures but also supply N using legume cover crops and non-manure based organic fertilizers, such as Nature Safe 13-0-0 and Chilean nitrate. In 2014, many corn plots that only received 50 lbs of N/a in the form of Nature Safe 13-0-0 yielded over 170 bu/a. In 2018, multiple corn plots with cover crop fallow in 2017 and a modest rate of pelletized chicken litter (1 ton/a, ~ 55 lbs of N/a) in spring 2018 yielded over 220 bu/a.

What are the economic opportunities and risks for organic farmers?

The main economic opportunity for organic farmers is that wholesale organic prices are often 50-150% higher than conventional prices. Direct marketing of organic crops can add even more value. Organic costs of production may or may not be higher than conventional costs depending on labor requirements and use of purchase inputs.

There are plenty of risks. For example, if weeds are not effectively controlled, they can greatly reduce crop yields. Some weed control strategies that work well during a dry year are much less effective during a wet year. Selection of crop genetics that are well adapted to your farm conditions is very important. For example, if you plant a soybean variety that is susceptible to soybean cyst nematode in a field with a high soybean cyst nematode population, major yield loss is likely. To quote Jack Erisman, a leader in the organic farming community in IL, "organic farming requires a high level of skill and will to succeed".

What is the role of students on the farm?

Students are involved with almost all farm activities including plot design, map making, planting plots, weed control, research data collection, harvest, data analysis, statistics and, record keeping. Our goal is for student workers to be well-rounded in their knowledge of agriculture research and principles of organic farming when they are done working for us and for their time at the farm to be an excellent learning experience that will benefit them in their careers! In addition, Dr. Gruver leads field trips at the farm for (his students and other classes of all ages – 90 first and second graders visited the farm in May 2015).

Your website asks for gifts. Please explain how those are helpful/how they are used? How is this farm funded?

The research farm is primarily funded by crop sales. We also receive some grant funding, but are restricted in how we can use it. For example, most grants do not allow the purchase of farm equipment. Our field days and other events are free to the public, but involve significant costs so we try to have sponsors help pay for those expenses. Our website requests financial assistance, but if someone had equipment or even services that they were willing to donate, that would also be acceptable. Every year we pay for land rental, equipment rental, some inputs (seeds and fertilizers) and student labor. Donations help offset these costs.

What do you want people to know about the Allison farm?

The Allison Farm is a unique site where large-scale practical organic research is conducted to solve problems faced by organic farmers (and conventional farmers who are interested in cover crops, soil health, crop diversification…).

We regularly host public events including a large summer field day that usually draws a crowd of 150+ people including many from several hours away. At the field day, we have guest speakers, demonstrations, plot tours, farmer panels, and a complimentary meal featuring local and organic products. In addition to the field day, we have Twilight Tours targeted at students and local farmers each fall. If individuals can't attend a scheduled event, they can contact us to set up a personal tour of the farm.

How can someone find out more information about the WIU Organic Research Program?

Additional information is available on the WIU Organic Program website:
http://www.wiu.edu/ag/organicfarm

Specific questions can be sent to Dr. Joel Gruver (Director of the WIU Organic Program) or Andy Clayton (Farm manager and research technician):

j-gruver@wiu.edu, (309) 298 1215 – office, (309) 569 0817 - cell
aw-clayton@wiu.edu, (309) 298 1172 – office, (217) 322 2639 -cell