Cedar Meadow Farm

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Dr. Fredrick Magdoff,

The following is a report of the "Economic Comparison and Weed Control Observation of 15" row Corn vs. 30" row Corn" that I did in cooperation with SARE Project # FNE 96-128.

The goal in this project was to compare the economics of 15" row corn vs. 30" row corn and also observe the potential of reducing herbicides due to earlier crop canopy closure of the 15" rows. I wanted to determine if this system would justify switching over to 15" rows for all of my corn crop.

I farm 175 acres with my father in southern Lancaster County, Pennsylvania. We grow corn, alfalfa. soybeans, small grains, and vegetables-mainly tomatoes and pumpkins. 50 steers are fattened annually. Using the no-till system of planting, intensive crop rotation, and the use of cover crops and animal manures we are able to greatly reduce soil erosion, control insects and diseases with less pesticides, and provide nutrients for ou r crops at a minimal cost.

It was a pleasure to be able to have Leon Weber of Rodale Institute collaborate with me on this project. He helped organize and publicize the field day as well as sending press releases to various media outlets. At the field day he gave the opening overview of the days activities and his perspective of my farming approach. When the corn was harvested he helped by providing the scales to weigh the various plots and kept track of the weights as the corn was combined. He has scheduled me to speak at the Pennsylvania Association for Sustainable Agriculture's annual meeting about my experience with 15" row corn.

Bob Anderson -Penn State Extension helped me to lay out the plots and oversaw the planting procedure. He took soil nitrate tests and observed weed control throughout the year and then did the actual acreage measurements of the plots at harvest. He will be putting the results of the project in the "Extension News".

Dr. Greg Roth gave me some of the information that he has gleaned concerning 15" corn. He spoke at the field day and had a very good perspective on the national trends and research findings for ultra-narrow row corn. He will be including my projects research with the other research that he has accumulated this year.

On April 4 I sprayed 2/3rds of my herbicide. Planting was delayed due to wet weather but we finally got it done on May 20th. The plots were laid out in random order. I sprayed the balance of herbicide on May 25th and than around the middle of June Bob Anderson checked the soil and corn leaves for available nitrogen and determined that no additional nitrogen was needed. However, I did foliar ~~fooler~~ feed some fertilizer at that time. We didn't notice much difference in weed pressure at this time between the two trials. At the field day, Dr. Greg Roth pointed out that there was less sunlight hitting the soil surface in the 15" rows which would help subdue late season weeds. Sure enough, by harvest time you could see a difference between the 15" and 30" rows. Fall Panicum was less vigorous in the 15" plots. The corn was combined in the middle of November and despite some initial concerns of being able to harvest the 15" rows the process went smoothly. We noticed next to no yield loss due to 15" rows being harvested by a 30" head. Each plot was weighed and than calculated to yield per acre on a dry weight basis. The corn for silage field was hand checked when the corn was at full maturity and the yield was calculated on a per acre basis.

We found that we got significant yield increases in both the silage and grain fields by going to 15" rows. The silage gave 6.53% greater tonnage and the grain yield was increased by 9.5% This was enough to more than pay for a few increased expenses that are incurred by planting in 15" rows. These results were in line with what others have been finding in ultra narrow row corn.

In answering the economic question "does it pay?", I'd say the that this year it certainly did. I incurred $11.94 more expense per acre in 15" rows but with corn at $3.00 a bushel and getting 14.56 bushel per acre more in 15" rows that comes to $43.68. Subtract the $11.94 and you get a $31.74 profit per acre. ~~I had $12.70 more expense in the corn for silage field. 15" rows yielded 1.55 tons per acre more and at a value of $25.00 per ton that's $38.75 more than 30" rows. Subtract the Extra cost of $12.70 and you get a $26.05 increase. The benefit of greater weed control can also be added but would not be as easy to document. Also the increased cost of 15" row equipment would need to be factored in.~~ *

I would like to take this project a step farther by focusing more research on how 15" row corn effects weed control and soil erosion control. I have submitted a proposal to SARE for farther research on this in 1997. I've had enough experience and have heard enough positive reports from others to commit to continuing this project. I think it will have a profitable impact on producers who are capable of making the switch to 15" rows.

A lot of people have been looking forward to seeing my results. I've had several farmers and industry representatives call me this fall to see if I had harvested my 15" corn yet. I've told them that the concept is worth while checking into and it is justifiable at the very least to give it a try.

A good article appeared in the Lancaster Farming newspaper that reported on our field day. I have hosted two farm tour groups(one of which SARE's very own Rob Myers was on!) and have shown slides at one farmer meeting and have three more scheduled for the beginning of 1997.

* Unsophisticated, plant germination very uneven. The little data taken only indicate increase of 0.3 ton acre", not 1.55 as first reported.

Steve Groff, 15 vs 30 inch Corn 1996 Growing Season

In Cooperation with : Leon Weber, Rodale Institute
Dr. G. Roth, Penn State Agronomy Dept.
Bob Anderson, Lancaster Co Extension

	Row Spacing	Length	Width	Area in Acres	Harvest Wt.	Weight / Acre	Moisture %	Bu/Ac.
Area #1	30 inches	1612	10	0.3701	3050 lbs	8241.81 lbs	0.205	138.47
Area #2	15 inches	1605	10	0.3685	3250 lbs	8820.56 lbs	0.205	148.19
Area #3	15 inches	1594	10	0.3659	3250 lbs	8881.43 lbs	0.205	149.21
Area #4	30 inches	1607	10	0.3689	3000 lbs	8131.92 lbs	0.205	136.62
Area #5	30 inches	1609	10	0.3694	3100 lbs	8392.54 lbs	0.205	141.00
Area #6	15 inches	1600	10	0.3673	3550 lbs	9664.88 lbs	0.205	162.37

All 30 inch Plots Averaged = 138.70
All 15 inch Plots Averaged = 153.26

15 inch row advantage = 14.56

% increase = 9.50%

Note: While harvesting Area #3, the combine operator had difficulty avoiding the first row of Area #4 and may have harvested several hundred feet of that plots first row

Steve Groff, 15 vs 30 inch Silage Corn
1996 Growing Seasor

In Cooperation with : Leon Weber, Rodale Institute
Dr. G. Roth, Penn State Agronomy Dept.
Bob Anderson, Lancaster Co Extension

	30 inches			15 inches		
N Rate	Plant Population	Silage Tons/Ac	Ear Corn Tons/Ac	Plant Population	Silage Tons/Ac	Ear Corn Tons/Ac
0	26,000	23.5.	9.3.	23,000	23.8	10.0
~~179 lbs~~	~~24,000~~	~~24.0.~~	~~10.3.~~	~~30,000~~	~~26.8~~	~~11.4~~
~~Average:~~	~~25,000~~	~~23.75~~	~~9.80~~	~~26,500~~	~~25.30~~	~~10.70~~
			% Change :	~~6.00%~~ -11.5%	~~6.53%~~ 1.3%	~~9.18%~~ 7.5%

Check area was 1/2,000 acre 8 feet, 8 1/2 inches for the 30 inch rows (8.708' × 2.5')
and 17 feet, 5 inches for the 15 inch rows (17.417' × 1.25')
~~A 6 % increase in the population in the 15 inch rows yield a 6.53 % increase in the tons of silage which is not significant, larger harvest areas are needed to determine the significants~~

Only 1 section of row sampled from each treatment.
Notable that the fewer number of plats in the 15" plot gave more silage, but since this was not replicated, no statement is possible.

till is subject down on farm

Steve and Cheri Groff will demonstrate no-till agriculture techniques on Wednesday, July 24, from 1-3 p.m. at their Martic Township farm.

Anyone interested in producing high quality food while saving money and protecting the environment at the same time is encouraged to attend the field day.

"It's going to be a fast-paced thing because there's a lot to talk about," said Groff, who has gradually been reducing his use of herbicides.

A rolling stalk chopper will be used to prepare a cover crop of soybeans and German millet. A no-till vegetable transplanter will be used to transplant broccoli into the cover crop.

Dr. Abdul Baki will discuss his experience with this system, which he developed at the U.S. Department of Agriculture research center in Beltsville, Md.

Machinery dealers and fertilizer company representatives will be on hand.

Also on view at the farm will be Groff's grain corn crop. Planting corn in narrow rows decreases weed pressure, Groff says, while no-till farming cuts costs and erosion.

Farmers and nonfarmers alike are invited to the event, which drew 75 people last year.

To reach Cedar Meadow Farm from Lancaster, take Route 272 South to Buck. Turn right on Route 372 (Holtwood Road) and drive west about four miles to Hilldale Road. Turn right on Hilldale Road and continue 1.5 miles to the Groff farm on the right.

For more information, call 284-5152.

C8-Lancaster Farming, Saturday, July 13, 1996

No-Till Cropping Systems At Field Day

HOLTWOOD (Lancaster Co.) — New cover crop options, a Buffalo rolling stalk chopper for managing cover crops, and a no-till vegetable transplanter will be demonstrated on Wednesday, July 24 from 1-3 p.m. here at Steven and Cheri Groff's farm.

The development of new equipment and cover crops have opened up additional cropping system options for vegetable growers interested in conserving and improving the quality of their soils.

The use of cover crops and no-till transplanting vegetables can help farmers reduce soil erosion, which averages nine tons per acre in Lancaster County. It can also cut costs. Production costs on the Groff farm for no-till transplanting tomatoes into a cover crop mulch were $500 per acre lower than for tomatoes grown on plastic last year. Based on his positive experiences with the no-till transplanter's capability to function with cover crop residues in 1995, Steve Groff has continued to experiment with different cropping systems and methods for managing the cover crops.

Steve used the rolling stalk chopper when 25 percent of the hairy vetch plants were flowering in May. There was very little regrowth on the vetch, even though no herbicide was used. The hairy vetch and rye formed a thick vegetative mulch into which he no-till transplanted tomatoes. The mulch suppresses weeds, conserves moisture, and serves a source of nitrogen for the tomatoes.

Last fall Groff made an experimental planting of AU Early Cover, a newly released hairy vetch that flowers about 10 days earlier than the common hairy vetch. This is the first time this variety was grown this far north — thus the winter hardiness of AU Early Cover is unknown. It survived the winter on the Groff farm with no evidence of winter kill.

At the field day, the rolling stalk chopper will be demonstrated in a planting of German millet and forage soybeans. Broccoli will be no-till transplanted into this cover crop residue. Dr. Abdul-Baki, who developed this cropping system at the USDA-ARS Beltsville Agricultural Research Center, will discuss his experience with this system. The no-till vegetable transplanter is provided for vegetable growers by the Keystone Chapter of the Soil and Water Conservation Society.

This is Groff's second year experimenting with cover crops and no-till transplanting. This work is sponsored by the Regional Infrastructure for Sustainable Agriculture (RISA).

In addition to the no-till vegetable cropping systems, the field day will also feature work Groff is doing with 15-inch silage and grain corn production. Steve has observed a decrease in weed pressure with narrow-row corn. This year he is also finding less grass pressure in the area of the field where narrow row corn was planted in 1995. The increase in nutrient uptake by narrow-row corn in being monitored by Robert Anderson, Lancaster County cooperative extension agent. Groff will be measuring yields of replicated plots of silage and grain corn grown on 15- and 30-inch rows. The on-farm research with narrow row corn is supported by a farmer grant from the Northeast Region Sustainable Agriculture Research and Education Program.

The use of new cover crops, expanding no-till methods to horticulture crops, and growing corn on 15-inch rows are methods Groff is using to build on the conservation ethic practiced by his parents. The farm has a long history of practices such as contour strips and grass waterways. Some fields have been in continuous no-till production for 13 years. The practices demonstrated at the field day are additional methods to minimize erosion, reduce the use of pesticides, and produce high quality crops without sacrificing yields.

No-Till Vegetables Trap Soil Moisure, Stem Weeds, Keep Harvest Clean

ANDY ANDREWS
Lancaster Farming Staff

HOLTWOOD (Lancaster Co.) — One prominent vegetable grower believes that no-till vegetable transplanting technology has proven extremely beneficial in conserving soil moisture, suppressing weeds, stemming disease pressure, and keeping the harvest area (and thus the harvest) clean.

For growers, this technique can translate into higher dollar returns for nearly any type of transplantable vegetable, including tomatoes, broccoli, cabbage, pumpkins, and others.

This was the message that more than 100 growers took home Wednesday afternoon at the No-Till Transplanted Vegetable Field Day at Steve and Cheri Groff's farm near Holtwood.

One of the big advantages to the grower is being able to choose when they can plant and when they can harvest, according to Dr. Ronald D. Morse, horticultural department at Virginia Tech, who spoke at the field day.

As a result of no-tilling into a mulch, growers can "get in the field two to three days sooner, which can amount to big returns in profit," said Morse, who helped

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teve Groff, top center, hosted a field day at his farm to look at no-till broccoli transing and other test plots Wednesday afternoon.

Bob Anderson, Lancaster agronomy agent, explained the use of the device he is holding, a chlorophyll meter, to determine plant nitrogen use at the Groff farm.

No-Till Vegetables Trap Soil Moisure, Stem Weeds, Keep Harvest Clean

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developed the technology.

Morse spoke about the no-till transplanting equipment that he helped develop and refine for the past five years. The device, which can adapt to any finger or carousel-type transplanter, is called the Subsurface Tiller-Transplanter, or SST-T for short.

Morse, who wore a baseball cap with the inscription "Say Yes To No-Till," said that the no-till approach to transplanting vegetables began with a producer who wanted to grow cabbage in a county south of Blacksburg, Va., on a slope that was prone to severe erosion. Researchers started a hand-transplanting trial with a cover mulch, which worked fine, but a commercial, high- volume applicator was needed. This led to the development and refinement of SST-T for commercial use.

Steve Groff has about nine acres of no-till vegetables this year. They include one acre of broccoli and eight acres of tomatoes (three acres fresh market and five acres commercial). The tomatoes are grown using a hairy vetch cover, pioneered by Dr. Abdul-Baki, who developed the cropping system at the USDA-ARS Beltsville Agricultural Research Center.

Before using the transplanter system on broccoli, Groff uses a rolling stalk chopper to flatten and crimp the mulch cover (Groff uses a combination German millet and forage soybean mixture).

The two-component system, according to Morse, uses a subsurface tiller which works like a deep-tiller to loosen the ground underneath the mulch. Then a transplanter, finger or carousel type, can be used to insert the plug plants. Two shoes then roll over top of the soil, packing it around the plug.

While some of the millet/soybean cover may recover after rolling and crimping, the weeds are kept at a level that they don't affect potential yield. On the Groff farm, a demonstration made use of the stalk chopper and the transplanter. The broccoli was planted in rows 18 inches apart with 18 inches between plants.

The advantage to using broccoli with this method is the faster canopy, allowing the natural mulch to break down and retain moisture while stemming weed pressure.

The SST-T has been used successfully with 16 different crops, including most species of cabbage, in addition to broccoli, cauliflower, tomatoes, potatoes, cucumber, watermelons, and pumpkins. All vegetable crops seem to work well with this no-till approach, according to Morse.

Morse worked on a successful no-till trial using potatoes.

The only drawbacks to using the SST-T and no-till material are that there are some concerns, because of the potential for moisture retention, about slugs (not experienced at the Groff farm) and the fact that mulches cool the soil. As a result, according to Morse, no-till works well with late-planted vegetables.

The SST-T has been modified over the years so that it is a one-pass machine. In one pass over the field, the tiller breaks up the cover, deep tills, transplants, fertilizes, and even lays a drip irrigation line. This helps keep soil compaction down.

Also, using no-till reduces the amount of weed seed that can germinate in the soil. This produces what Morse refers to as a "stale seedbed," ideal for growing any type of vegetable crop.

"Pumpkins are a particularly good crop for no-till systems," said Morse.

Morse said that Virginia farmers have expressed interest in the technology mostly because it allows them to work the fields and harvest when they choose. He has seen good results, too — less early blight with tomatoes (soil does not splash onto the leaves) and less late blight with tomatoes and potatoes.

"We encourage people to give it a try, even a little bit, say a half-acre or so," said Morse. "Work with county agents and growers such as Steve Groff."

Groff recently purchased the rolling stalk chopper for use on all the vegetable acres.

"The beauty of the machine is that it is fast and easy to use," said Groff. The transplanter was rented from the Keystone Soil and Water Conservation Society for $10 per acre.

To rent the machine, for producers in Lancaster, contact the county conservation district at 299-5361; for York producers, contact the district at 755-2966; and for other counties, contact Ron Phelps at the Pocono RC&D at (717) 586-1019.

Also at the field day, trials included the advantages of narrow row corn, no-till soybeans, no-till tomatoes, early tomatoes, processing tomatoes, and no-till pumpkins. *

* The Reporter got to the field day late and missed the 15" corn segment. Hence not much information