

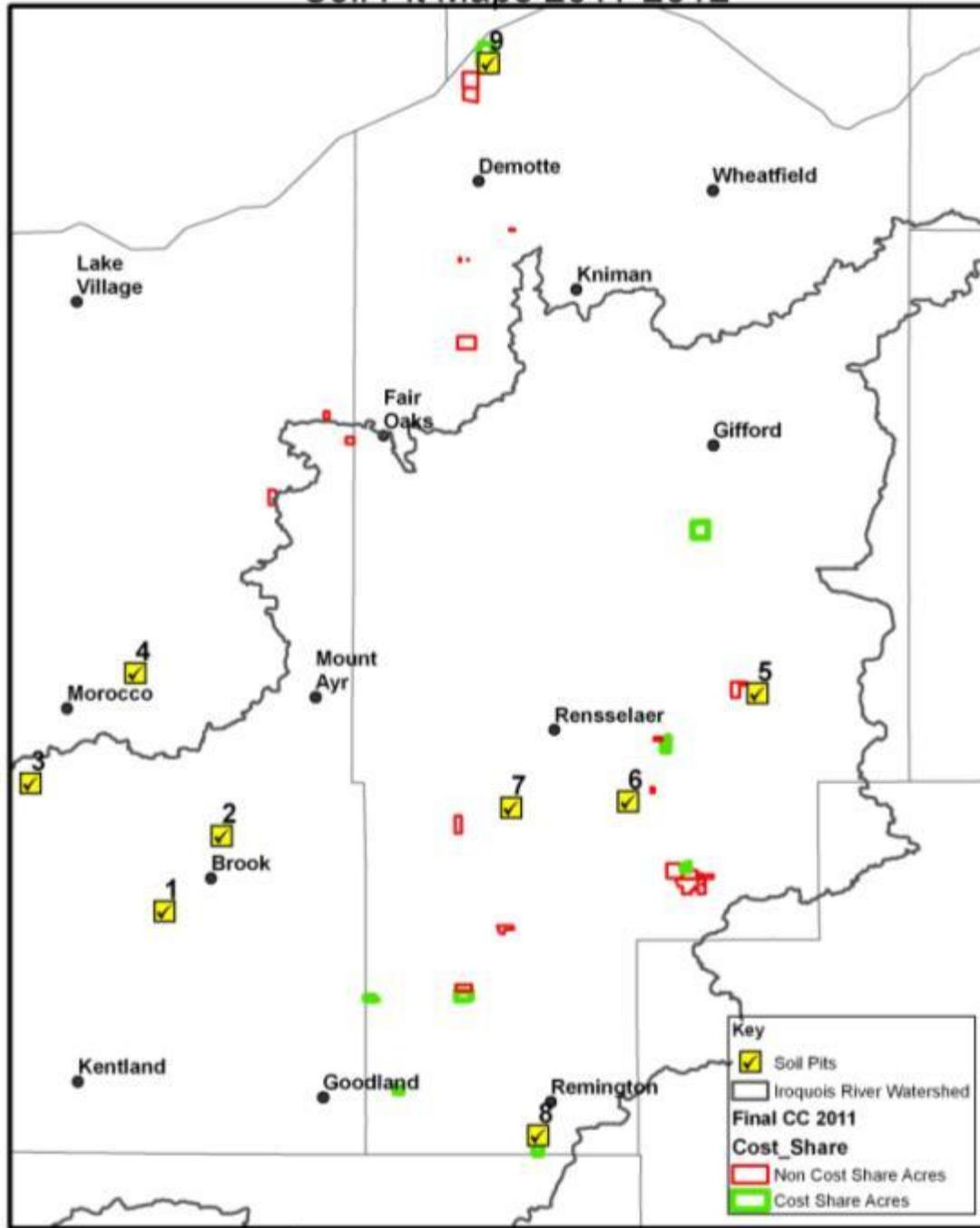
Jasper-Newton County SWCD Cover Crop Report Spring 2012



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Soil Pit Maps 2011-2012



by Dan Perkins SWCD Not for legal use

*Map does not have Newton Cover Crop Fields
 ** Rye silage acres not included
 ** Mapped only field visited cover crop fields

Jasper/Newton SWCD Cover Crop Report Spring 2012

In general, cover crops for Jasper and Newton Counties were planted in September and even into mid-October in 2011. A lot of different cover crop stories are happening and we can say with confidence that cover crops do work in Jasper and Newton Counties! Now we are discovering which ones, in what rotation, and for what benefits. All the information in this report is from cover crops grown in Jasper and Newton Counties.

Currently, cover crops are being used ahead of corn and beans, on prevented planting acres, in seed corn, after wheat, after corn silage, in manure situations, on irrigated fields, and sub-irrigated fields, in vegetable production, and organic fields. Some are drilled, aerial seeded, or broadcast on with fall fertilizer. We dug 5 soil pits in fall 2011 and returned to 4 of the 5 and added 3 new pits in Spring 2012. Each field and farm is different and therefore what we saw and were interested in varied a lot.

Here are the goals farmers (in their own words) are trying to accomplish (no ranking):

• Capture nitrogen	• Promote soil biology
• Improve soil quality	• Address compaction
• Reduce weed population	• Manure nutrient capture
• Prevent wind and water erosion	• Build organic matter
• Provide nitrogen credit	• Break hardpan layers
• Increase yields	• Reduce risk of drought
• Diversify rotation	• Be a steward

We had ideal rains for cover crop establishment in 2011. Rainfall total average was 7.5 inches from Aug 15 to Sept 30 (CoCoRaHS network data), compared to just 2.75 inches of rain in 2010 during the same time period. This is the critical establishment window for getting good stands and early growth. Although, many growers seeded well past Sept 30 and are having good stands.

It was unseasonably warm during the spring of 2012 and that really favored cover crop growth and lead to some interesting management dilemmas. The biggest question; was when to spray the great stands of cover crops? The answer all varied on cover crop goal, field conditions, planting date of crop, and management comfort level, so I cannot give blanket recommendations. We certainly saw some great stands and with this shaping to another year of the armyworm and cutworm, the general principle of spraying 2-3 weeks before planting was advice well given.

So what did we observe and find (soil pit sites label by number on front page map)?

Summary of rooting depth from Fall 2011 compared to Spring 2012:

Soil Pit Site	Seed Method	Seeded Into	Cover Crop Type	Rooting Depth		Picture	Video	Key Observations
				10/5/2011	4/5/2012			
1	Aerial	Beans	ryegrass, clover, radish	21 inches	48 inches	Y	Y	clover not grow well in 7.5 inch row beans
2	Broadcast	Prevent plant	oats and radish	34 inches	40 inches	Y	N	visible plow pan breakage, nice soil structure
3	Aerial	Beans	ryegrass, clover, radish	22 inches	24 inches	Y	Y	worm eggs and high count, channels 30" deep
4	Broadcast	Prevent plant	clover, radish	No pit	15 inches	Y	N	Salt or pH issue 16 inches down, no roots, mystery?
5	Drilled	after wheat	cereal rye, clover, radish	20 inches	30 inches	Y	Y	Tremendous stand, seed sooner after wheat harvest
6	Aerial	Corn	ryegrass, cereal rye, radish	No pit	36 inches	Y	Y	Roots into parent material, didn't seem to be thick stand, but roots say differently
7	Drilled	Prevent plant	crimson clover, radish	No pit	36 inches	Y	Y	clover nodules at 24 inches, airway compaction layer
8	Aerial	popcorn	ryegrass, clover, radish	No pit	36+ inches	Y	Y	Best nodulation seen
9	Aerial	Seed Corn	ryegrass, clover, radish	20 inches	No pit	Y	Y	best stand of cover crop

Jasper County Cover Crop by Type and Acres

Cover Type	Seed Method	Acres
Cereal Rye	drilled, broadcast, aerial	719
Annual Rye/Radish/Crimson Clover	aerial	647
Cereal Rye/Radish	aerial	209
Cereal Rye/Austrian Winter Peas	broadcast then VT	145
Cereal Rye, Annual Rye, Radish	aerial	140
Oats/Radish	broadcast then manure inj.	123
Crimson Clover/Radish	drilled	120
Crimson Clover/Turnip/Radish	broadcast then VT	35
Wheat	drilled	6
Oats/Radish/Austrian Winter Peas	broadcast then harrowed	0.4
	Total Acres	2,145

* More cc acres exist, but these are field verified and those I have had personal contact with in Jasper County.



Soil Pit 1 Nov 16, 2011:

Very little top growth does not mean very little root growth. This aerial seeded radish into soybeans on Sept 12 had well over 12" of root depth. Newton County, Indiana.

See video Soil Pit 1.

Photo taken Nov 16, 2011.
Dave Robison.



Soil Pit 1 April 4, 2012.

Proof of soil building is in the measurement and color change in this heavy clay sub soil being improved by building organic matter around the roots, 28 inches down around this cover crop root using the old soybean root channel.

The channel of darker color is an easy path for corn roots to get to more nutrients and water = drought tolerance and yield boost!



Soil Pit Field 1 April 4, 2012 Photo. Dan Perkins



Soil Pit 2 April 4, 2012

Ready to plant with this winterkilled cover crop of oats and radish. Notice green of canola/oilseed rape from use of bin run oats.

Photo taken April 4, 2012 by Dan Perkins.



Soil Pit 2 April 4, 2012.

This long dead radish is the nutrient storage capsule that will feed this year's crop and soil biology. Not to mention it keeps nitrogen from leaching out into our waterways!

Although this appears to leave a hole, this was filled with rich dark soil and a planter will easily deal with this light residue and it will not affect seeding depth.



Soil Pit 3 April 4, 2012.

This beautiful stand of annual ryegrass, crimson clover, and radish is ready to burn down. Barry Fisher NRCS State Agronomist preaches soil health from the pit.

This pit had the highest count of earthworms, egg casings, and channels that I have ever seen in a soil pit. The field has been no-till for only 2 years.

The cover crop is giving this farmer a jump start on soil biology and a competitive edge!

Photos taken April 4, 2012 Dan Perkins.



Soil Pit 5 April 4, 2012

In all the other soil pits we had been finding crimson clover roots at 30+ inches, but at this site all roots stopped at 15 inches as shown in below picture.

Why? Salt of pH stratification?

The field was noted for never growing good alfalfa, which doesn't do well in high salt soils. Interesting.

Photos taken April 4, 2012 by Rose Morgan





Soil Pit 5

Don't judge a cover by what is on top, it is what is underneath that matters.

Not to mention the spring growth really makes a difference as well!

Photo taken Sept 23, 2011 by Dan Perkins



Soil Pit 5 April 4, 2012

The cereal rye really took off this spring along with great clover growth. Roots down 30 inches and clear compaction layers cut through by roots in both Fall and Spring soil pits.

See video reference Soil Pit 5 for more details.

Photo taken April 5, 2012 by Dan Perkins.

Soil Pit 6

This picture was taken Sept 30, 2011 two weeks after aerial seeding. Looks like a poor stand but . . .

This picture was taken Nov, 2011 after harvest, the farmer was still concerned that he wasn't getting any benefits . . .

Photo taken Nov 15, 2011 by Dan Perkins



Soil Pit 6 April 5, 2012

The value of digging a soil pit was made evident, as after seeing 36 inches of root depth into parent material this farmer was more assured he got his money's worth!

Photo taken April 5, 2012 by Dan Perkins

Soil Pit 7

Drilled Sept 16th, 2011: crimson clover and radish.
Heavy, wet clay ground prone to flooding.

No Fall 2011 soil pit was dug.

Photo taken Oct 25, 2011 by Dan Perkins



Soil Pit 7 April 5, 2012

Digging a soil pit, radish was long gone. .

Photo taken April 5, 2012
by Dan Perkins



Soil Pit 7 April 5, 2012

Amazing, nodulation of clover roots at 24 inches. This means nitrogen for corn that far down.

Visible evidence of compaction layers broken.

Photo taken April 5, 2012 by
Dan Perkins



Soil Pit 8

Aerial flown ryegrass, clover, and radish into popcorn on September 13, 2011.

No Fall 2011 soil pit dug, but spring 2012 soil pit . . .

A great stand.

Photo taken Oct 25, 2011 by Dan Perkins



Soil Pit 8 April 5, 2012

36 + inches of root depth into parent material, this farmer will keep cover cropping! We couldn't dig deep enough to find the ends of the roots!

See video reference Soil Pit 8.

Photo taken April 5, 2012 by Dan Perkins



Soil Pit 9 Nov 15, 2011

No soil pit dug in Spring 2012, but this cover crop success is worth re-telling.

Photo taken Nov 15, 2011 by Dan Perkins.

These cover crops were flown into a seed corn on September 2, 2011 in sub-irrigated fields. Both the radish and annual ryegrass had roots over 20" deep (breaking through compaction layers, holding nitrogen, and building soil deeply).



Soil Pit 9 April, 2012

In a nearby field to the soil pit.

Using a shorter season (29) bean does impact stand establishment of the cover crop.

On right is shorter season bean, left is longer season.

See video Soil Pit 9 for discussion

Photo taken Sept 23, 2011 by Dan Perkins

Spring 2012 Summary Observations:

Soil Pit 1 farmer reported that he saw less visible drought stress where they had long term no-till and cover crops, attributing the healthier plants to increased root depth.

Soil Pit 2 had canola or oilseed rape in fields where bin run oats had been planted instead of seed oats.

- Soil Pit 2 had radish and oat roots that were 34" deep last fall were found at 40" deep this spring (though dead).

Soil Pit 3 had 20 earthworm channels and 5 earthworms in an area 8" by 8" square at 6 inches deep (in a mixture of annual ryegrass, crimson clover, and cover crop radishes).

- Soil Pit 3 had earthworm channels 48" deep in a field that had been long term no-till with one year of cover crop annual ryegrass/radish mix (planted after soybeans).

Soil Pit 6 had roots from two different crops in the same root zone/earthworm channel (soybeans and cover crop roots) over 30" deep.

In general:

- Earthworms galore, especially where we had radishes and/or crimson clover. But the earthworms were plentiful in all cover crop species.
- Continued evidence of compaction. One year of cover crops does not eliminate all compaction issues (though roots from cover crops did penetrate through the compaction).
- Barry Fisher encouraged everyone to "expand your farm vertically." In other words, don't just keep buying/renting more land. Instead, put cover crop roots down deeper to create better land where you farm – and get more yield.

Narrative observations summarized from field notes, soil pit field days from Dan Perkins, Barry Fisher, Dave Robison and farmers.

Video Postings of Cover Crops:

Soil Pit 1 Newton County Soil Health soil pit: <http://youtu.be/T7ZvNZxQP-M>

Soil Pit 5: Radish residue, and when to spray 2012: http://youtu.be/KHQOA_5BOeE

Soil Pit 8 Southern Jasper Soil Pit and Soil Health 3 min : http://youtu.be/YaOSut_ftpA

Soil Pit 9: When to spray annual ryegrass discussion? <http://youtu.be/Bk-idz1sV4Q>

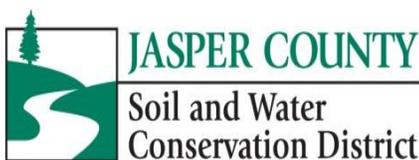
Soil Pit 9: Does shorter season bean effect cc establishment? <http://youtu.be/BTh5dQmJ1s>

The power of the radish to break compaction: <http://youtu.be/hHFXlrMb9Y8>

The total conservation cropping system: <http://youtu.be/VxSi3pDGKto>

Top 11 Observations from Fall 2011 and Spring 2012 Soil Pits

- 1) Compaction cannot be solved in one year and arguably with just steel alone. One year of cover crops does not eliminate all compaction issues (though roots from cover crops did penetrate through the compaction). Soil compacted is chemically bonded, so it takes roots and soil biology to change the chemistry, so use both!
- 2) Correct timing of aerial application into cash crops is vital (that the crops are mature enough for cover crop success). This is going to change year to year based on maturity dates and weather, but in general it seems the first week in September is good for seeding into soybeans. Corn is too variable to predict at this point.
- 3) Corn and soybean variety maturity differences can change "success" rates. If you can plan to use a shorter season corn or bean without sacrificing yield it may be well worth the effort for making the most of a cover crop and spreading out harvest time.
- 4) It appears that row spacing in soybeans makes a big difference for aerial seeding, 7.5 inches makes establishing cover crops difficult.
- 5) Treat a cover crop like a cash crop. Plan early for using cover crops and be willing to change the plan as conditions require. Have plan A and B with different cover crop types.
- 6) Place seed order early (by May), just to get the mixes and varieties needed (varieties do matter!). You can always change or cancel the order.
- 7) Start small, 20-40 acre field. Oats and radish is a good mix for a first time use of cover crops. They winter kill and establish well in a variety of conditions.
- 8) Read, talk with other farmers, call your local SWCD office, as they have a list of cover crop users in your area, and plan for success.
- 9) If you have prevented planting acres, practice good stewardship and try a cover crop!
- 10) A variety of cost share programs are available! But, the technical advising is probably the most valuable.
- 11) Please make sure to visit a soil pit in a cover crop field in Fall 2012. Mark your calendars for November in Jasper and Newton Counties.



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