Managing Double Crop Soybeans

John Pike
Pike Ag, LLC
Marion, IL

Why Wheat/Double-Crop?

Opportunities?

- Profit
- Farm diversity
- Spread workload?
- Summer cash flow*
- Reduce soil erosion
- Reduce nutrient loss*
- Markets for straw?
- New early wheat varieties
- **Increasingly competitive compared to corn on "challenging" acres***

Challenges?

- There are challenges to everything we do but with proper planning and attention to management, this rotation is very competitive.

ISA/IWA Early Wheat System Comparison Trials

DOUBLE CROPPING
in Illinois

1ty of Illinois at Urbana-Champaign/Cooperative Extension Service/Circular 1106

CONTENTS

This publication was prepared by the following College of Agriculture faculty members: R. G. Hoeft, John Wedberg, M. C. Shurtleff, A. G. Harms, R. A. Hinton, Randall Nelson, W. O. Scott, G. E. McKibben, H. J. Hirning, M. D. Thorne, D. E. Millis, H. A. Cate, J. C. Siemens, and F. M. Sims.

Urbana, Illinois January, 1975

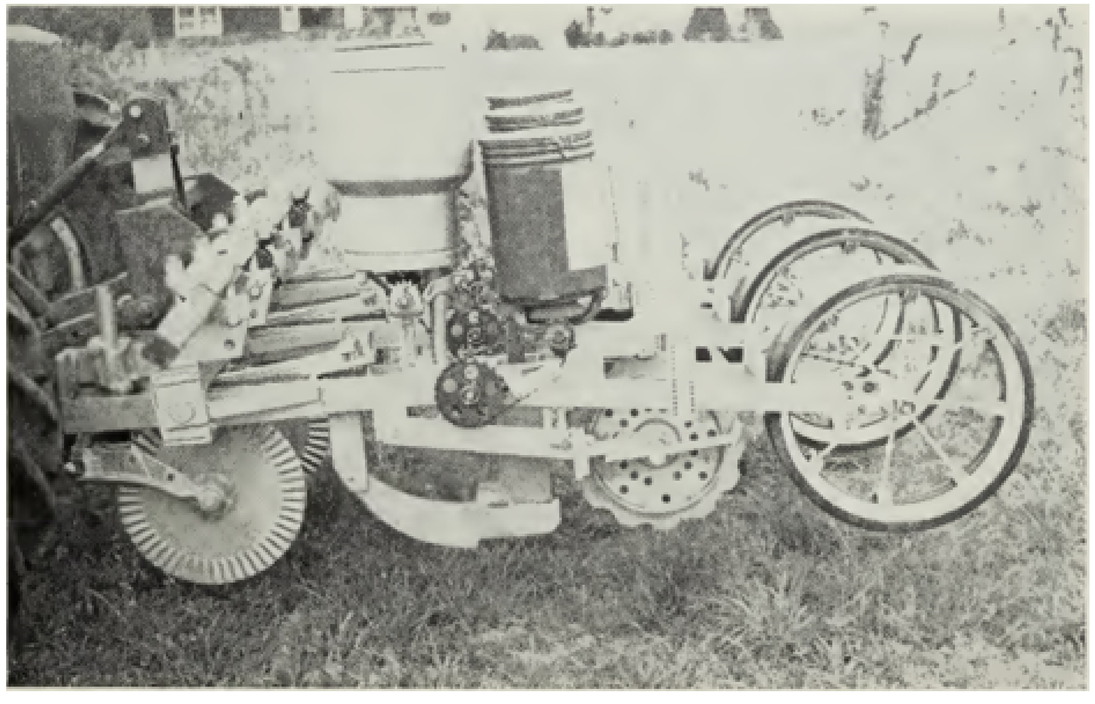
Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. JOHN B. CLAAR, Director, Cooperative Extension Service, University of Illinois at Urbana-Champaign.

20M-1-75-29903

DOUBLE CROPPING IN ILLINOIS

In the midwest, double cropping usually means producing two crops in one year or three crops in two years on the same acreage. A typical example is farmland being planted to wheat in the fall; the wheat being harvested the following summer and the land immediately planted to soy- beans, corn, or grain sorghum to be harvested in the fall of that year. The same acreage, provided the soil and terrain is such to handle intensive row-cropping, could then be planted to wheat again in the fall or to corn or soybeans the following year. Thus, the double-cropping system results in two crops in one year or three crops in two years on the same acreage.

There are other patterns of double cropping in Illinois, such as, rye or winter barley followed by soybeans, corn, or grain sorghum; hay or pasture harvested early in the season and the acreage then planted to a row crop. This publication will focus on the following double-cropping pattern: winter wheat followed by soybeans, corn, or grain sorghum in the same season. Farmers interested in cash grain production might choose soybeans; while those wanting livestock feed might choose grain sorghum or corn.



A research model of a new, efficient zero-till planter, which works in grass sods, cornstalks, soybean stubble, wheat stubble, briar patches, or prepared seedbeds. (Fig. 1)

Project Objectives

- Compare yields of earlier Wheat varieties to standard varieties
- Compare DC Soybean planting dates after early Wheat harvested at high moisture vs. standard Wheat varieties and harvest moisture
- Evaluate wheat quality difference by harvest management

Project Collaborators

AGRI MAXX

ILLINOIS SOYBEAN ASSOCIATION
CHECKOFF & MEMBERSHIP PROGRAMS

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Plot Locations and Field Days

- **Walnut, IL**
  Dr. Jeff Wessel
  Corn Belt Ag Services
- **Wyoming, IL**
  Jeff Maupin
  SGS
- **Effingham, IL**
  John Bailey
  JBC Ag Services
- **Marion, IL**
  John Pike
  Pike Ag, LLC

Wheat/DC Field Days

Wheat/DC Field Day

Photo: Karen Binder, IL AgriNews

Comparison of Crop Budgets

Table 4. 2019 Crop Budgets, Southern Illinois.

	Corn-after-Soybeans	Corn-after-Corn	Soybeans-after-Corn	Soybeans-after-Two Years-Corn	Wheat	Double-Crop Soybeans
Yield per acre	167	157	50	48	68	41
Price per bu	$3.65	$3.65	$8.50	$8.50	$4.20	$8.50
Crop revenue	$610	$573	$425	$408	$286	$349
ARC/PLC	6	6	6	6	6	0
Crop insurance proceeds	0	0	0	0	0	0
Gross revenue	**$616**	**$579**	**$431**	**$414**	**$292**	**$349**
Fertilizers	$134	$144	$40	$40	$98	$28
Pesticides	78	84	55	55	29	40
Seed	106	106	64	64	41	48
Drying	7	7	0	0	1	0
Storage	6	6	4	4	1	1
Crop insurance	22	22	14	14	8	4
Total direct costs	**$353**	**$369**	**$177**	**$177**	**$178**	**$121**
Machine hire/lease	$13	$13	$12	$12	$14	$11
Utilities	7	7	7	7	7	5
Machine repair	28	28	26	26	31	22
Fuel and oil	18	18	19	19	16	14
Light vehicle	1	1	1	1	2	2
Mach. depreciation	69	69	66	66	47	27
Total power costs	**$136**	**$136**	**$131**	**$131**	**$117**	**$81**
Hired labor	$28	$28	$25	$25	$15	$14
Building repair and rent	7	7	4	4	6	6
Building depreciation	16	16	9	9	8	5
Insurance	12	12	12	12	9	0
Misc	10	10	10	10	7	0
Interest (non-land)	23	23	20	20	21	11
Total overhead costs	**$96**	**$96**	**$80**	**$80**	**$66**	**$36**
Total non-land costs	**$585**	**$601**	**$388**	**$388**	**$361**	**$238**
Operator and land return	**$31**	**-$22**	**$43**	**$26**	**-$69**	**$111**

Prepared by: Gary Schnitkey, University of Illinois, schnitke@illinois.edu, 217 244-9595.
Available in the management section of farmdoc (www.farmdoc.illinois.edu).
Revised: September 2018

Comparison of Crop Budgets

Table 3. 2019 Crop Budgets, Central Illinois -- Low Productivity Farmland.

	Corn-after-Soybeans	Corn-after-Corn	Soybeans-after-Corn	Soybeans-after-Two Years-Corn	Wheat	Double-Crop Soybeans
Yield per acre	197	187	60	55	81	41
Price per bu	$3.60	$3.60	$8.50	$8.50	$5.00	$8.50
Crop revenue	$709	$673	$510	$468	$405	$349
ARC/PLC	6	6	6	30	30	0
Crop insurance proceeds	0	0	0	0	0	0
Gross revenue	**$715**	**$679**	**$516**	**$498**	**$435**	**$349**
Fertilizers	$145	$155	$40	$40	$26	$74
Pesticides	75	81	46	46	29	37
Seed	120	120	62	62	41	50
Drying	20	20	1	1	1	0
Storage	12	12	5	5	1	1
Crop insurance	22	22	15	15	8	5
Total direct costs	**$394**	**$410**	**$169**	**$169**	**$106**	**$167**
Machine hire/lease	$12	$12	$10	$10	$12	$9
Utilities	6	6	5	5	5	5
Machine repair	25	25	21	21	19	19
Fuel and oil	14	14	14	14	13	13
Light vehicle	1	1	1	1	1	1
Mach. depreciation	64	64	55	55	45	35
Total power costs	**$122**	**$122**	**$106**	**$106**	**$95**	**$82**
Hired labor	$15	$15	$14	$14	$11	$11
Building repair and rent	5	5	4	4	2	6
Building depreciation	13	13	11	11	9	9
Insurance	10	10	10	10	8	0
Misc	8	8	8	8	7	0
Interest (non-land)	18	18	14	14	16	7
Total overhead costs	**$69**	**$69**	**$61**	**$61**	**$53**	**$33**
Total non-land costs	**$585**	**$601**	**$336**	**$336**	**$254**	**$282**
Operator and land return	**$130**	**$78**	**$180**	**$162**	**$181**	**$67**

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Comparison of Crop Budgets

Table 2. 2019 Crop Budgets, Central Illinois -- High Productivity Farmland.

	Corn-after-Soybeans	Corn-after-Corn	Soybeans-after-Corn	Soybeans-after-Two Years-Corn	Wheat	Double-Crop Soybeans
Yield per acre	213	203	63	65	85	41
Price per bu	$3.60	$3.60	$8.50	$8.50	$4.20	$8.50
Crop revenue	$767	$731	$536	$553	$357	$349
ARC/PLC	7	7	7	7	7	0
Crop insurance proceeds	0	0	0	0	0	0
Gross revenue	**$774**	**$738**	**$543**	**$560**	**$364**	**$349**
Fertilizers	$145	$155	$46	$46	$76	$28
Pesticides	75	81	45	45	27	40
Seed	114	114	73	73	50	48
Drying	18	17	1	1	1	0
Storage	15	15	8	8	1	1
Crop insurance	24	24	16	16	9	4
Total direct costs	**$391**	**$406**	**$189**	**$189**	**$164**	**$121**
Machine hire/lease	$13	$13	$14	$14	$18	$11
Utilities	5	5	4	4	7	5
Machine repair	24	24	20	20	33	25
Fuel and oil	17	17	15	15	20	22
Light vehicle	1	1	1	1	2	2
Mach. depreciation	63	63	54	54	49	27
Total power costs	**$123**	**$123**	**$108**	**$108**	**$129**	**$92**
Hired labor	$18	$18	$17	$17	$16	$14
Building repair and rent	5	5	4	4	3	6
Building depreciation	12	12	11	11	9	5
Insurance	10	10	10	10	5	0
Misc	9	9	9	9	10	0
Interest (non-land)	18	18	15	15	14	11
Total overhead costs	**$72**	**$72**	**$66**	**$66**	**$57**	**$36**
Total non-land costs	**$586**	**$601**	**$363**	**$363**	**$350**	**$249**
Operator and land return	**$188**	**$137**	**$180**	**$197**	**$14**	**$100**

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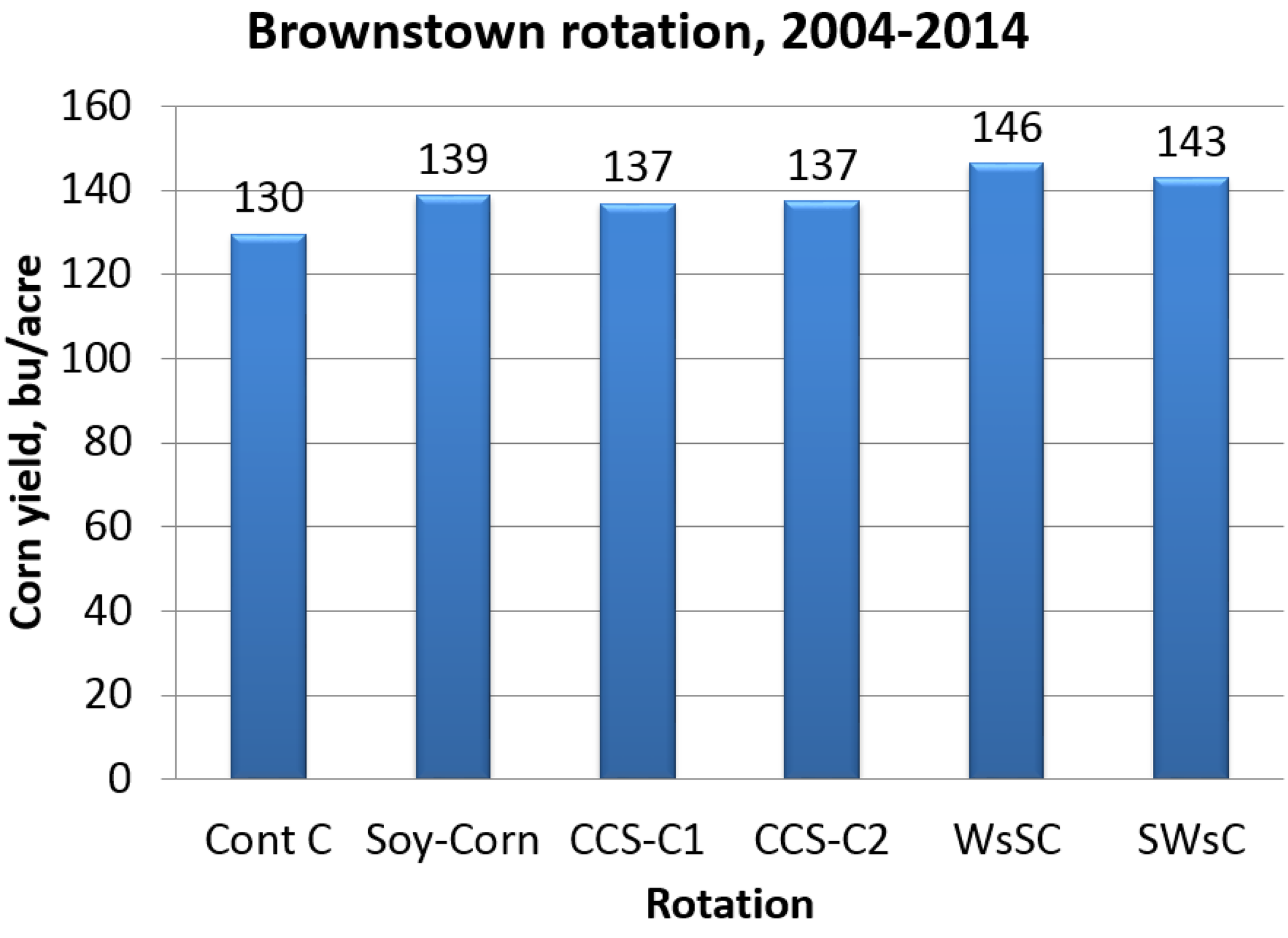
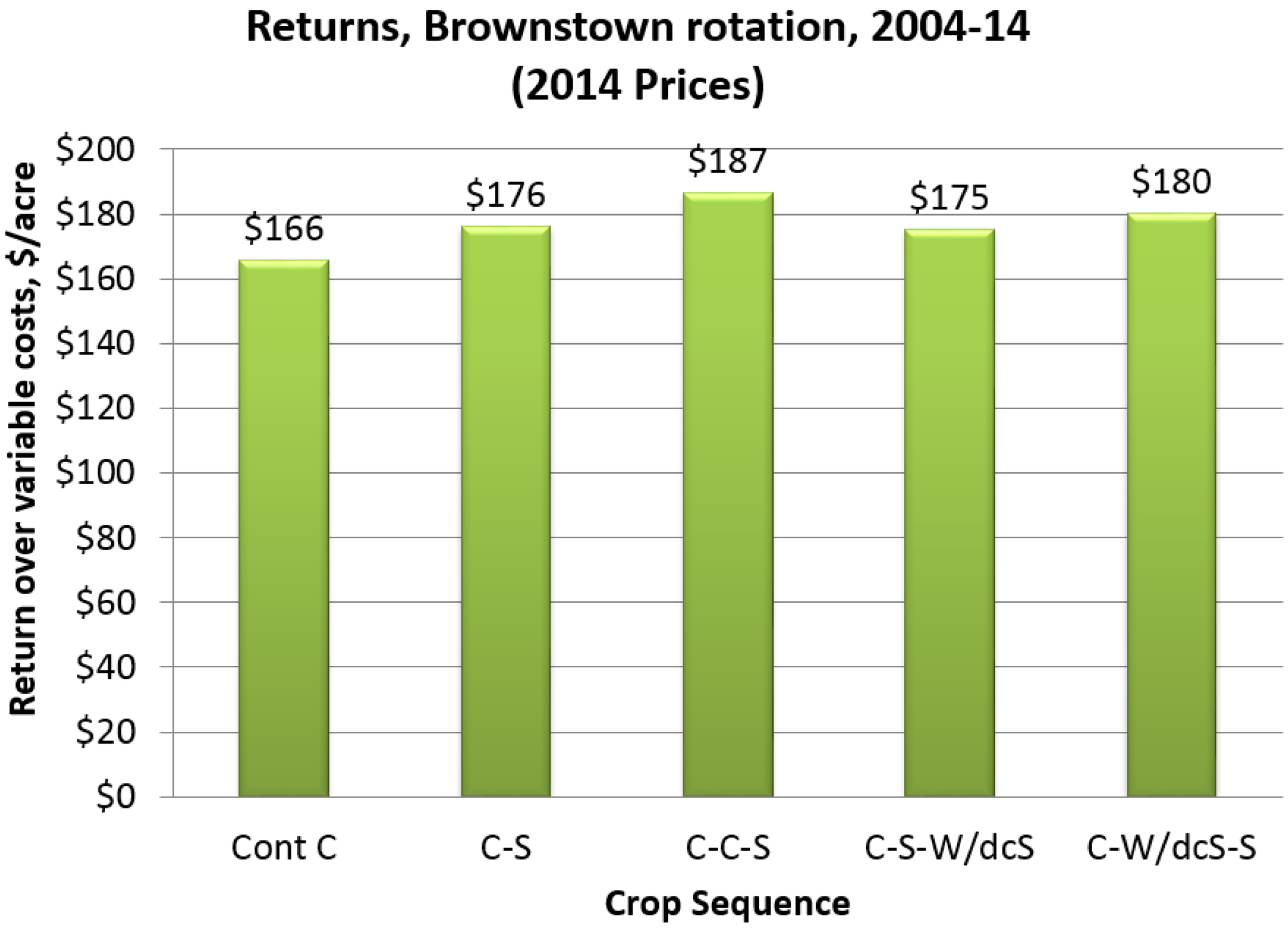
Wheat in Rotation Can Help Corn Yields



Competitive Returns of W/DC Rotation



Realistic Potential to Surpass Projected Budgets

- Top producers regularly achieve wheat yields well beyond the state average. (70+/- bu. vs. 85 – 100 bu.)
- Additional management for double crop soybeans, especially earlier planting date can also push those yields. (40bu. vs 45 – 50 bu.)

80 bu. Wheat @ $4.20 = $336 (Marion =70/53bu, Effingham = 89/58 bu.)

48 bu. DC Bean @ $8.50 = $408 @55Bu = $468

Total Gross Rev. = $744/ac. = $804

@ $3.65 Corn, $744 Gross Rev. = **204** bu. Corn

With 55 bu. DC, the rotation competes with 220 bu. Corn (Gross)

Plan for the Rotation

- Wheat and Double-Crop Soybeans tend to be considered separately.
  - Consider double-crop when planning for wheat crop

- **The benefits of the rotational system are only realized by maximizing the potential of <u>BOTH</u> crops.**

High Yield Wheat Management

- Choose a good variety!
  - Scab rating, Yield, Maturity, etc.
  - Earlier maturity is great but shouldn't be primary driver in selection
  - Treated seed + scout for aphids
- Plant as early as possible
  - Observe Fly-Free Date but push if avoiding weather delay
  - Watch planting after an early harvest, excess fall growth can cause problems
- Use a well calibrated/maintained drill
  - Lbs./ac. vs. Plant Population
  - 30 - 35 - 40 seeds/sq. ft. (1.3 – 1.7 million ppa+)
  - Trending to higher side with Mgmt.

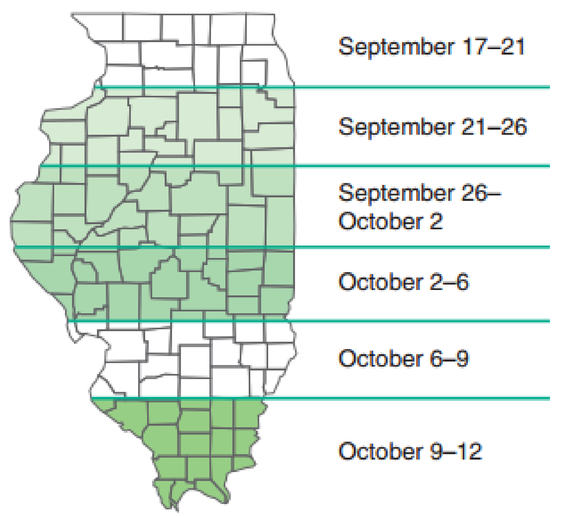


Figure 4.2. Ranges of Hessian fly-free dates in Illinois.

High Yield Wheat Management

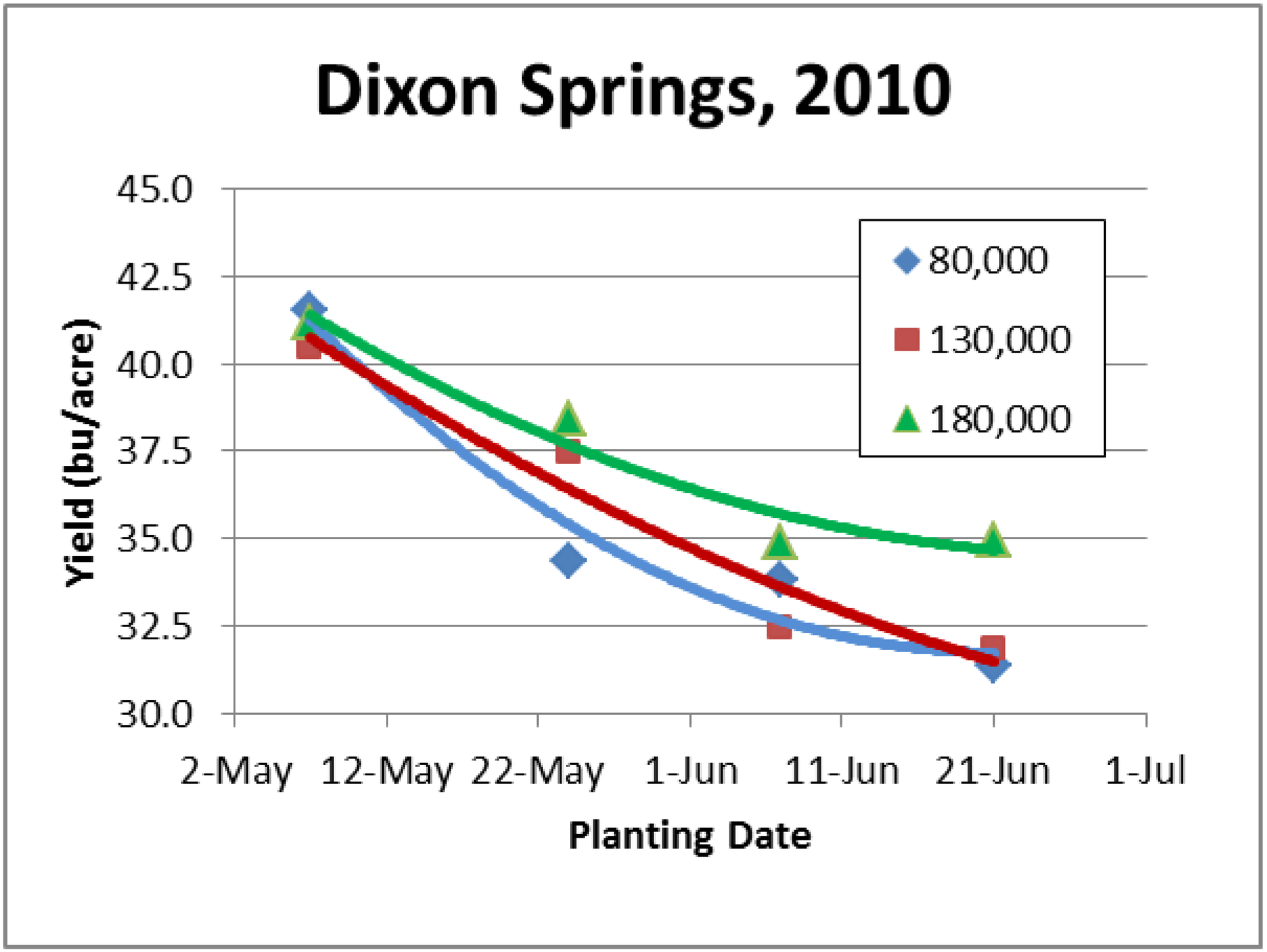
- Apply P & K for wheat AND DC Beans
  - 30# +/- Nitrogen at planting
- Timely spring N application
  - Split when practical (GS 3/5)
- Herbicide Plan
  - Fall, spring, both
- Fungicide Plan
  - Foliar (GS 8/9)
  - Heading (GS 10.5.1)
- Growth Regulator?
- Harvest FAST and EARLY and avoid total field dry-down
- The ability to dry wheat can pay
  - Wheat quality + Earlier DC planting

DC Soybean Management

- Plant as Early as Possible
  - Could gain 1bu/day

- Planting Population
  - 180,000 (at least) to 220,000+
  - Plants will be shorter so need more to generate yield
  - High populations also canopy sooner aiding weed control and water conservation

Population and Planting Date



DC Soybean Management

- Row spacing
  - With a drill or planter best capable of handling residue AND achieving best seed to soil contact.
  - Narrower rows would be great but a 15” planter does a better job in most cases.
    - No advantage to narrow rows if poor stand or emergence is delayed

DC Soybean Management

- Consider DC fertility needs when planning for wheat

NITROGEN, PHOSPHORUS AND POTASSIUM MANAGEMENT FOR INTENSIVE WHEAT AND DOUBLE-CROP SOYBEAN ROTATIONS

S. A. Ebelhar, C. D. Hart, and F. Fernandez

S. A. Ebelhar is an agronomist and C. D. Hart is a research specialist, Dept. of Crop Sciences, University of Illinois, Dixon Springs. F. Fernandez is an assistant professor, Dept. of Crop Sciences, University of Illinois, Urbana.

Timing	Wheat Fertilizer			DC Soybeans		2008 Soybean Yield			2009 Soybean Yield		
	DAP	Potash	N†	DAP	Potash	BARC	BRC	DSAC	BARC	BRC	DSAC
Ck (N only)	0	0		0	0	37.9	68.4	36.6	40.8	51.1	52.7
Wheat only	180	100		0	0	36.9	67.7	36.7	44.2	50.4	52.0
	230	125		0	0	38.2	67.4	37.8	42.3	49.7	55.5
	280	150		0	0	38.3	68.2	36.8	43.3	48.8	52.2
Split	120	30		60	70	35.4	67.2	37.5	43.3	48.5	53.1
	160	40		70	85	37.0	66.8	35.0	44.8	51.2	52.0
	200	50		80	100	38.6	67.4	36.4	43.0	51.1	53.1

If P or K levels are very low there might be a response from split application

DC Soybean Management

- Control weeds
- Scout for insects and disease pressure

DC Soybean Management

- Choose seed variety--- don’t just “take what’s left”

DC Soybean Management

- DC soybeans will need about 90 days to reach maturity.

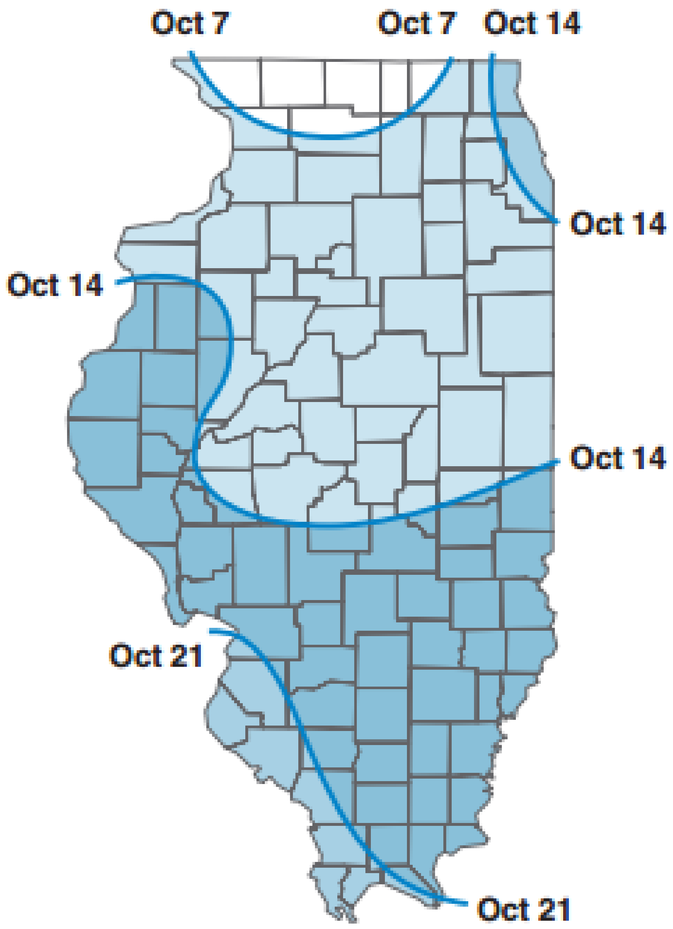


Figure 1.6. Average first occurrence in spring of 32 °F (0 °C) in Illinois, 1971 to 2000.

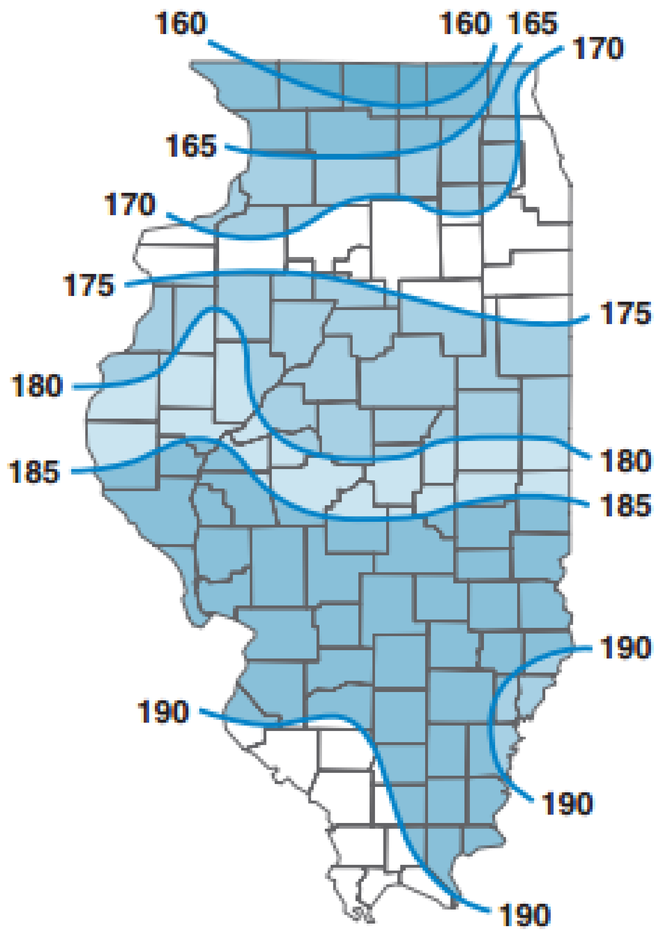


Figure 1.7. Average frost-free growing season length (days) in Illinois, 1971 to 2000.

Days to Maturity by Maturity Group

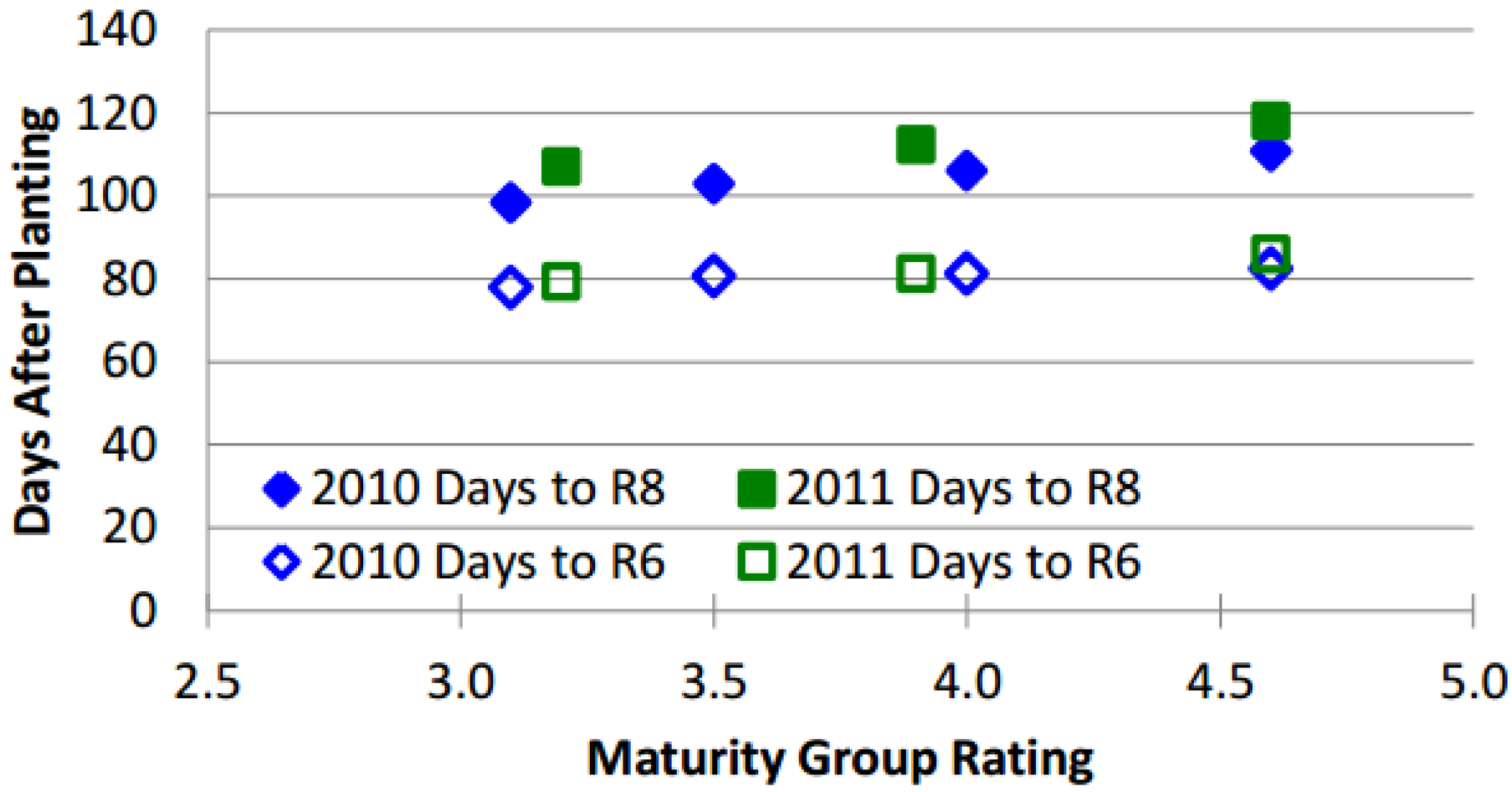
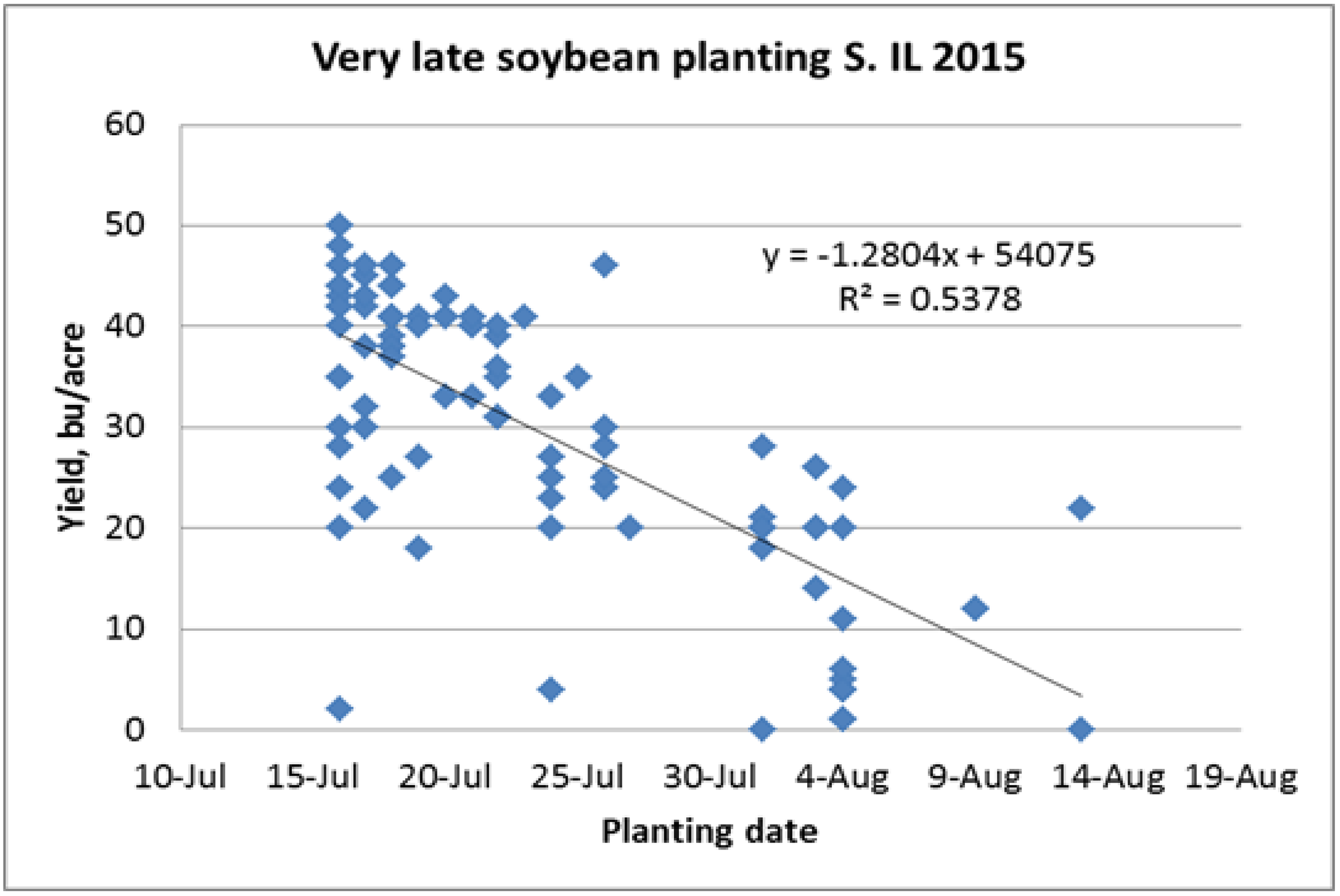


Figure 3. Time to reach R6 (full seed) and R8 (full maturity) based on maturity group when planted as double crop in southwestern Indiana (Vincennes) in 2010 and 2011.

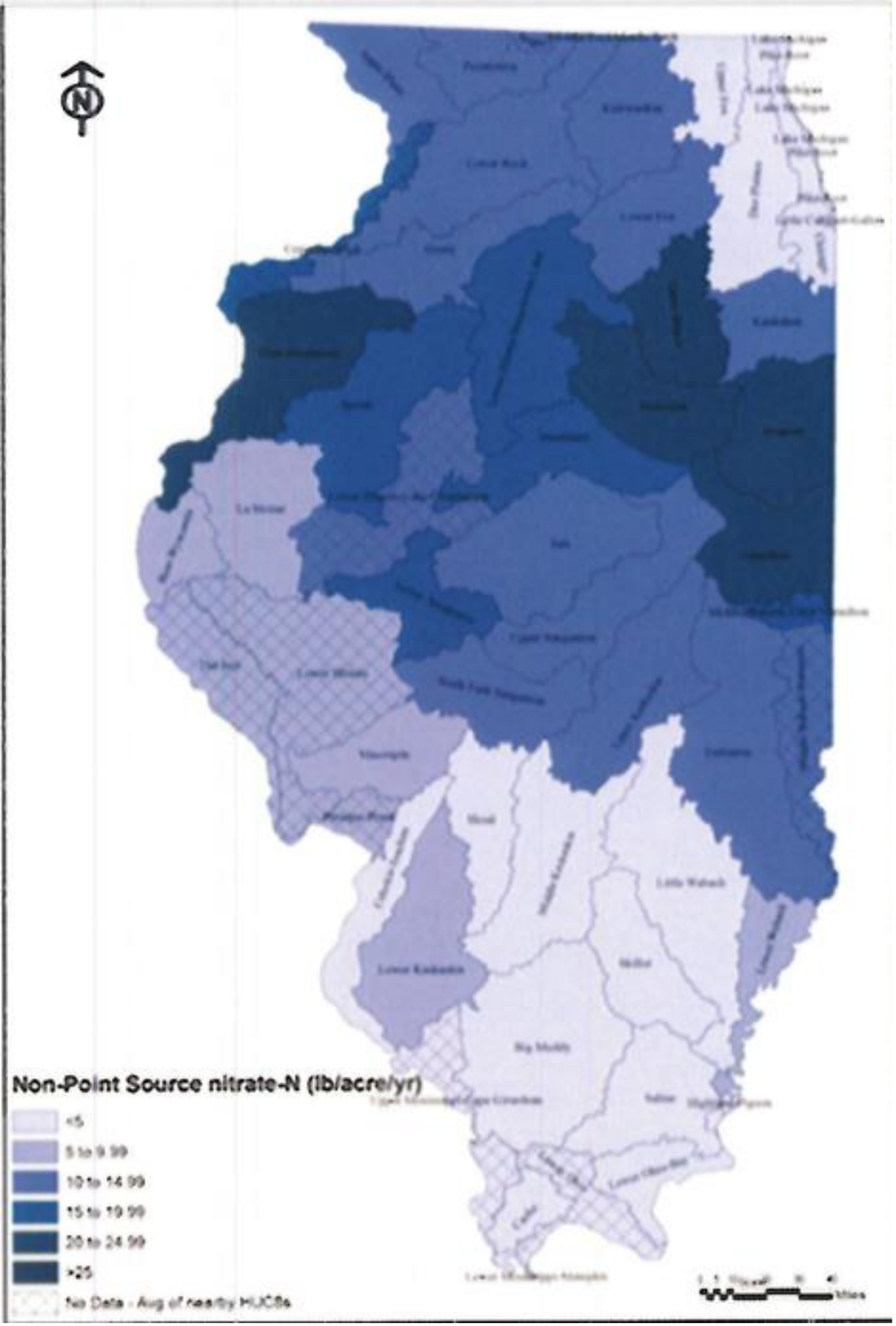
https://www.agry.purdue.edu/ext/soybean/News/2013/DC_Soy_Plant_Decisions_20130709.pdf



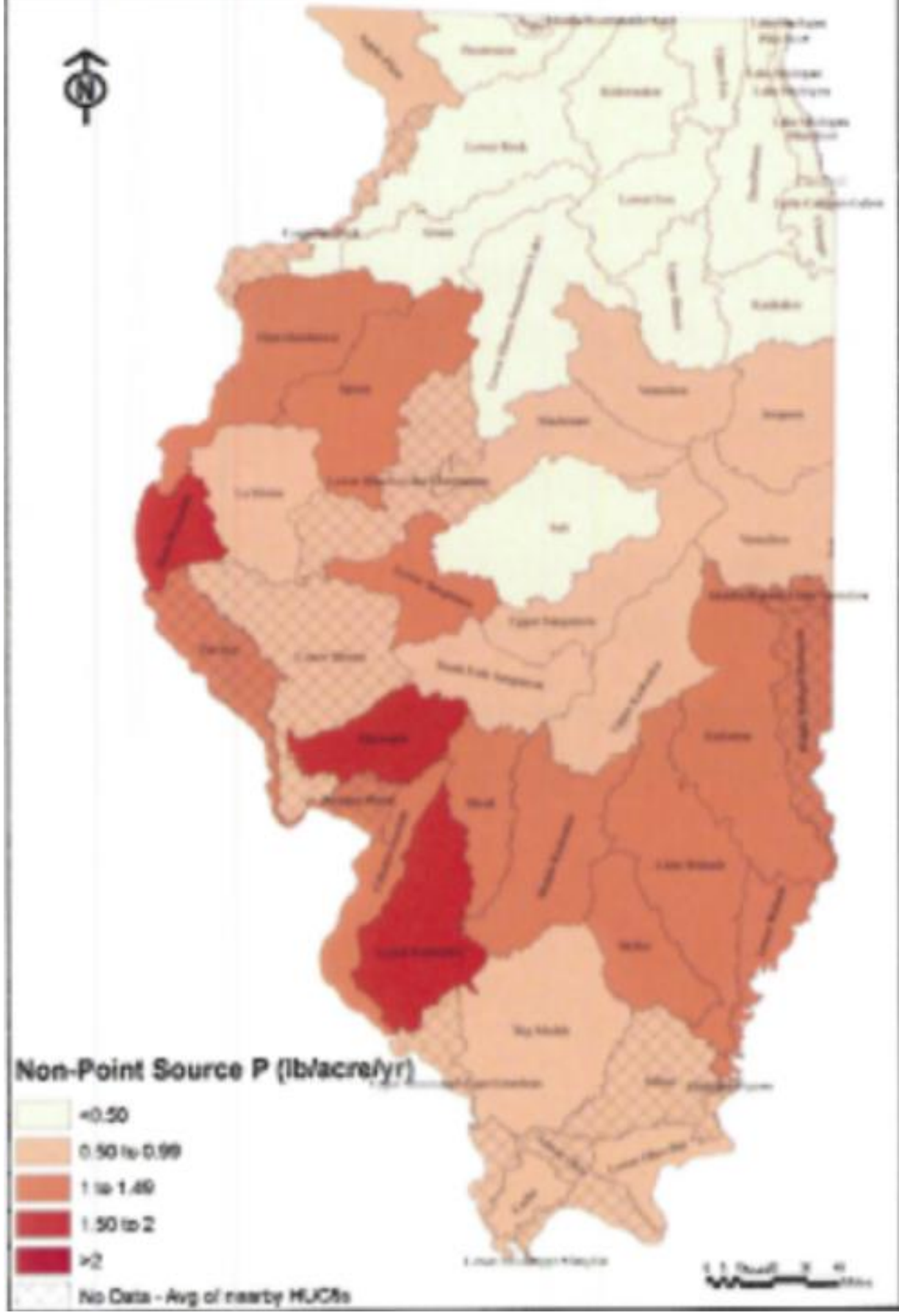
Pioneer/not double crop
population range = 170,000 – 250,000

Potential for Positive NLRS Impact

HUC8 Non-Point Source nitrate-N Yields



HUC8 Non-Point Source P Yields



NREC Project
Testing the IL NLRS

Longer Rotation with Cover Crops and Bioreactors

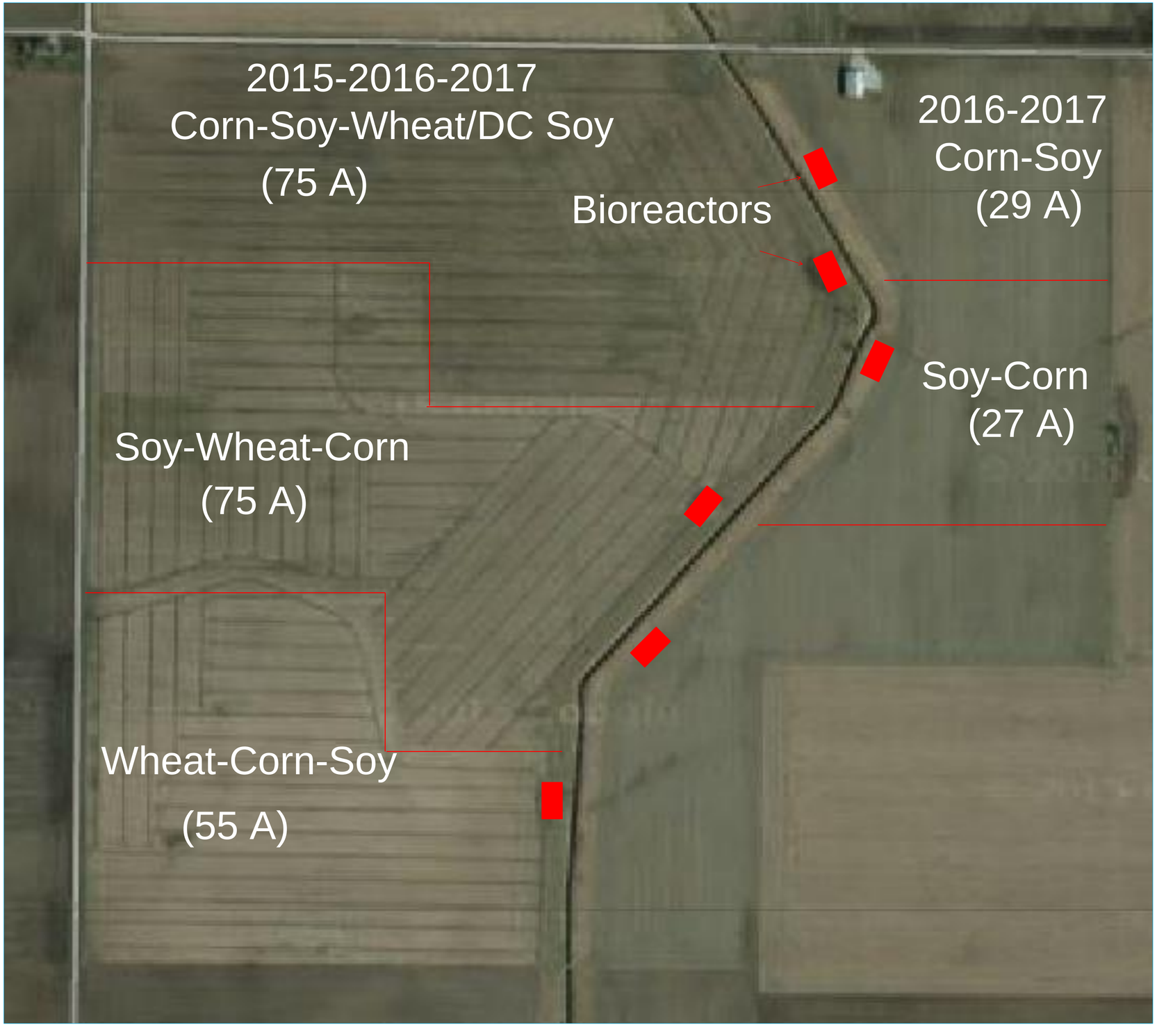
Corn

Soybean

Wheat

Field Design and Crop Rotation

Wheat
on west side
in 2014 for
tiling

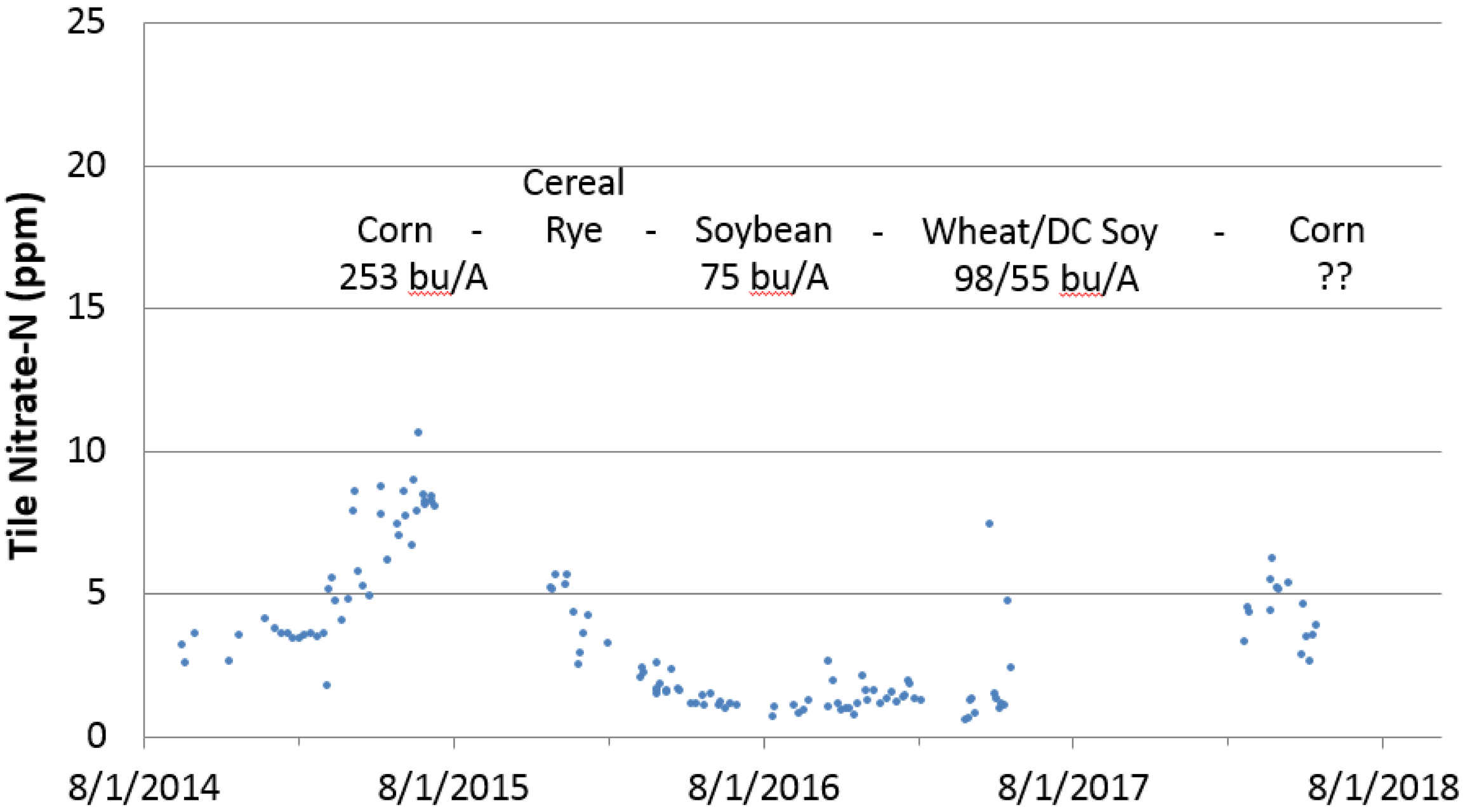


Wheat
on east side
in 2015 for
tiling

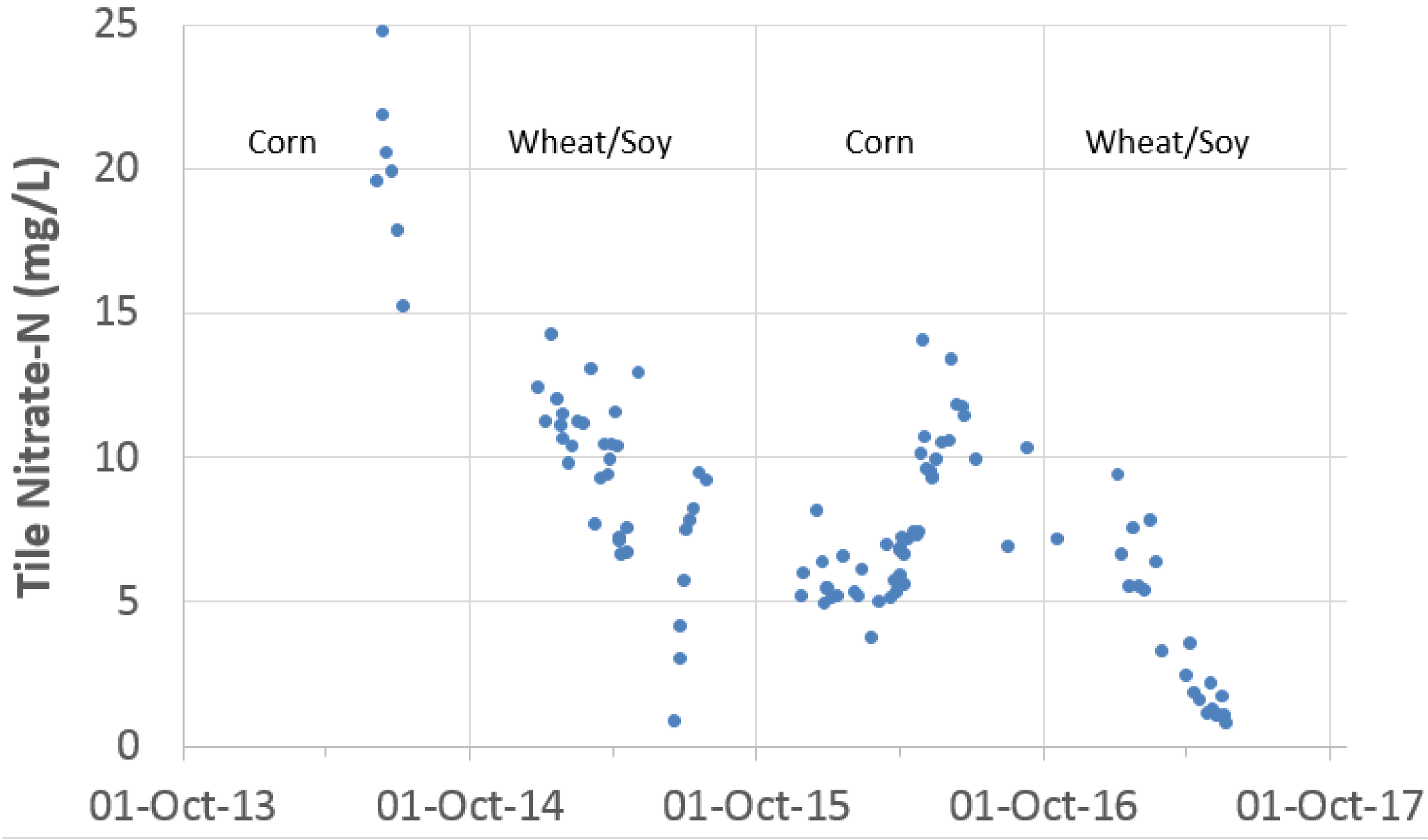
Methods

- C-S-W with each phase of the rotation every year.
- Cereal rye after corn, winter wheat after soybean, and double crop soybean after wheat.
- Strip-till corn, no-till soybean, and no-till wheat.
- Corn N = 20 lbs/A starter; 160 lbs/A as side–dress
- Wheat N = 24lbs/A as 1240D; 100 lbs/A as Super U with stabilizer.

Tile Nitrate Concentration from C-S-W



Corn – Winter Wheat and Double Crop Beans



Have a Safe and Profitable 2019!