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Corn & Soybean Replant Decisions

One of the toughest decisions to make in farming is to replant or not to replant. Replanting decisions should be based on facts but ultimately, what makes sense for each individual grower.

Determining Seeding Intentions

- Determine initial seed drop.
- Evaluate hybrids and seed treatments utilized on affected acres.
- Review seeding prescriptions.
- Keep in mind seed germination % and planting conditions.

Assess Stands

1. Take several stand counts in good, average, and worst areas. Utilize Table 1 and Table 2 for those calculations.

Table 1. *Row length that equals one-thousandth of an acre.*

Row Width	Row Length that Equals 1/1000 Acre
30 in	17 ft, 5 in
20 in	26 ft, 2 in
15 in	34 ft, 10 in

Table 2. *Hula hoop method for estimating population of drilled soybeans.*

Number of plants in hoop	Inside Diameter of Hoop (in)				
	30	32	34	36	38
	Thousands of Plants per Acre				
2	18	15	14	12	11
4	35	31	28	25	22
6	53	47	41	37	33
8	71	62	55	49	44
10	89	78	69	62	55
12	107	94	83	74	66
14	124	109	97	86	77
16	142	125	110	99	89

To perform the hula hoop method, randomly toss a hoop onto the field. Count the number of plants inside the hoop. Then use this table to determine the number of plants per acre: In the first column, find the number of plants in the hoop. Follow the row across to the column for the hoop's diameter. The number indicated is in thousands. For example, if 12 plants are inside a 34 inch hoop, the field contains about 83,000 plants.

2. Average the stand counts and understand the impact of replanting the good, average, or worst areas individually or the entire field. Refer to Table 3 for evaluations on corn and Table 6 for soybeans.

Corn

Planting date is crucial for setting the potential for high corn yields. So much so, a thinner stand from April planting can consistently outperform a perfect stand from late May planting.

Impact of Planting Date and Population on Corn Yield Potential - University of Illinois

Table 3

Planting Date	Plant Population Per Acre						
	10,000	15,000	20,000	25,000	30,000	35,000	40,000
	% of Maximum Yield Expected						
April 1	54	68	78	88	95	99	99
April 10	57	70	81	91	97	100	100
April 20	58	71	81	91	97	100	99
April 30	58	70	80	89	95	97	96
May 9	55	68	77	86	91	93	91
May 19	50	63	72	80	85	86	84
May 29	44	56	65	73	77	78	75
June 8	35	47	56	63	67	67	64

Yield Impact on soybeans due to later plantings.

Evaluate Stand Uniformity

Are there large skips and gaps? Extremely late emergers? The yield loss of those areas must also be accounted for.

Table 4

Yield Effects from Non-Uniform Stand
2% with Gaps of 1-3 ft
5% with Gaps of 4-6 ft

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Soybeans

Earlier and earlier plantings of soybeans have been recommended by most all agronomists the past 5 years. This is in response to the large yield increase April soybeans have been providing and modern seed treatments protecting the soybeans from pathogen invasions.

Soybeans in the vegetative stage can compensate tremendously well with thin stands. The following data supports the rule of thumb, "Soybeans are at almost 100% of yield potential at 100,000 plants/acre."

Table 5. *Yield impact of soybeans due to low populations.*

Population	Row Width (in)	
	30	7
	Percent of Expected Yield	
120,000	100	100
110,000	99	98
100,000	98	96
90,000	97	94
80,000	95	92
70,000	92	89
60,000	87	85
50,000	81	79
40,000	73	71
30,000	60	58
20,000	46	43

Estimated soybean yield potential at various plant populations (yield as percent of normal). Purdue

Table 6. *Yield impact of soybeans due to later planting.*

Planting Date	Yield as Percent of Normal	
	Mid-Season Variety	Full-Season Variety
May 20	100	100
May 30	96	94
June 10	92	90
June 20	82	78
June 30	70	NR
July 10	60	NR

NR=Not recommended
Adapted from Purdue Extension publication ID-179, Corn & Soybean Field Guide

Evaluate Stand Uniformity

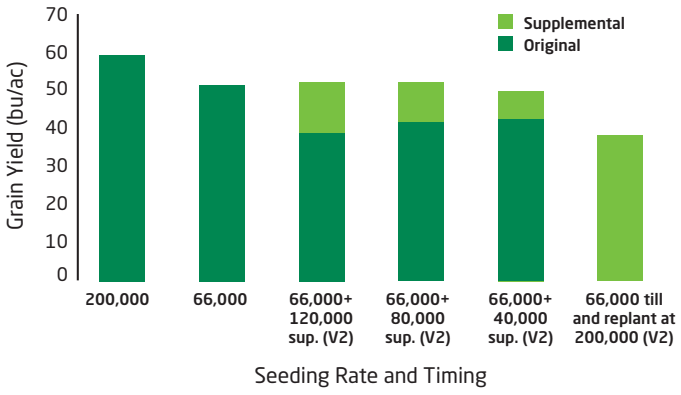
Table 7

Yield Effects from Non-Uniform Stand	
Plant Spacings	Yield as a % of Normal
2' Skips - 50% of Row	94
3' Skips - 50% of Row	87
4' Skips - 50% of Row	85

Filling in a Thin Stand

On corn and soybeans filling in a thin stand is generally not recommended. Below is a study from Purdue University that indicates additional plantings did not help the original stand at 66,000 population

Table 8



This graph shows the effects of filling in thin soybean stands (7.5-inch rows) with a 30-inch row planter at V2 soybean (Semmel, Christmas, and Marini, 2002). The dark green bars indicate the yields from the original soybean stands, the light green bars indicate yields from the added soybeans.

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Corn - Defoliation/Hail

In case of defoliation of corn from hail or other events the below is suggested by University of Nebraska.

Table 9. *Estimated percent corn yield loss due to defoliation occurring at various stages of growth.**

State of Growth	Percent Leaf Area Destroyed																		
	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
	Percent Production Lost																		
7-leaf	0	0	0	0	0	0	1	1	2	3	4	4	5	5	6	7	8	9	9
8-leaf	0	0	0	0	0	1	1	2	3	4	5	5	6	6	7	8	9	10	11
9-leaf	0	0	0	1	1	2	2	3	4	5	6	6	7	7	9	10	11	12	13
10-leaf	0	0	0	1	2	3	4	5	6	7	8	8	9	9	11	13	14	15	16
11-leaf	0	0	1	1	2	3	5	6	7	8	9	10	11	12	14	16	18	20	22
12-leaf	0	0	1	2	3	4	5	7	9	10	11	13	15	16	18	20	23	26	28
13-leaf	0	1	1	2	3	4	6	8	10	11	13	15	17	19	22	25	28	31	34
14-leaf	0	1	2	3	4	6	8	10	13	15	17	20	22	25	28	32	36	40	44
15-leaf	1	1	2	3	5	7	9	12	15	17	20	23	26	30	34	38	42	46	51
16-leaf	1	2	3	4	6	8	11	14	18	20	23	27	31	36	40	44	49	55	61
17-leaf	2	3	4	5	7	9	13	17	21	24	28	32	37	43	48	53	59	65	72
18-leaf	2	3	5	7	9	11	15	19	24	28	33	38	44	50	56	62	69	76	84

** Reprinted from the Corn Loss Adjustment Standards Handbook FCIE-2508 (11-2009) 2010 and Succeeding Crop Years, National Crop Insurance Services. This system counts a leaf as fully developed when the leaf tip points to the ground (not fully developed collar).*

Table 10. *Estimated percent corn yield loss due to stand reduction occurring through the tenth-leaf stage of growth (1/100 acre area).**

Remaining Plants in Sample (1/100) Acre																															
OS*	390	380	370	360	350	340	330	320	310	300	290	280	270	260	250	240	230	220	210	200	190	180	170	160	150	140	130	120	110	100	90	80
400	0	0	1	2	2	3	3	3	4	5	6	8	9	11	13	14	16	18	20	22	24	26	28	31	33	36	39	42	45	48	52	57
390	0	0	0	1	2	3	3	3	4	5	6	7	9	11	13	14	16	18	20	22	24	26	28	31	33	35	38	41	44	47	51	56
380		0	0	1	1	2	2	3	4	5	6	7	9	11	13	14	16	18	20	22	24	26	28	31	33	35	38	41	44	47	51	56
370			0	0	1	1	2	3	4	5	6	7	8	10	12	14	16	18	20	22	24	26	28	31	33	35	38	41	44	47	51	56
360				0	0	1	1	2	3	4	6	7	7	9	11	13	15	17	19	22	24	26	28	31	33	35	38	41	44	47	50	54
350					0	0	1	1	2	3	4	5	6	8	10	12	14	16	19	21	23	25	27	29	31	34	36	39	42	45	49	53
340						0	0	1	1	2	3	4	5	6	8	10	12	15	17	19	21	24	26	28	30	33	36	39	42	45	49	53
330							0	0	1	2	3	4	5	6	8	9	11	14	16	18	20	22	25	27	29	32	35	38	41	45	49	53
320								0	1	2	3	4	5	6	7	8	9	11	13	16	18	21	23	26	27	32	33	38	41	45	49	53
310									0	1	2	3	4	5	6	7	8	10	12	14	16	19	21	24	27	30	33	36	39	43	47	52
300										0	1	2	3	4	5	6	7	9	11	12	14	17	20	23	25	28	31	34	37	41	45	50
290											0	1	2	3	4	5	6	8	10	11	13	15	18	21	23	26	29	32	35	38	43	48
280												0	1	2	3	5	6	7	9	10	12	14	16	19	21	24	27	30	34	37	41	46
270													0	1	3	4	5	6	7	9	10	12	14	16	18	21	24	28	31	35	40	45
260														0	1	3	4	5	6	7	9	10	12	14	16	19	22	25	29	33	38	43
250															0	1	2	3	4	6	7	8	10	12	14	17	20	23	27	31	36	41
240																0	1	2	3	4	5	6	9	10	12	15	18	22	26	29	34	40
230																	0	1	2	3	4	5	8	9	11	14	17	21	25	29	33	39
220																		0	1	2	3	4	7	8	10	13	16	20	24	28	33	38
210																			0	1	2	4	6	7	9	12	16	20	24	27	32	37
200																				0	1	3	5	6	8	11	15	19	23	27	31	36

** OS = Original Stand*
Reprinted from the Corn Loss Adjustment Standards Handbook FCIE-2508 (11-2009) 2010 and Succeeding Crop Years.

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Soybean - Defoliation/Hail

In case of defoliation of soybean from hail or other events the below is suggested by University of Nebraska.

Table 11. *Percent yield loss of indeterminant soybean varieties as affected by degree of defoliation.*

Growth Stage	Defoliation (% Leaf Area Destroyed)									
	10	20	30	40	50	60	70	80	90	100
R1-2	0	2	3	5	6	7	9	12	16	23
R3	2	3	4	6	8	11	14	18	24	33
R4	3	5	7	9	12	16	22	30	39	56
R5	4	7	10	13	17	23	31	43	58	75
R6	1	6	9	11	14	18	23	31	41	53

Table 12. *Percent yield reduction in soybeans as affected by nodes cut off (number of nodes cut off expressed as percent of total number of nodes).*

Growth Stage	Percent Nodes Cut Off						
	5	15	25	35	45	55	65
V1-Vⁿ	0	1	3	5	7	11	18
R1-R2	1	4	7	9	12	16	23
R2.5	2	6	10	14	18	24	32
R3	3	9	14	19	25	32	41
R3.5	4	12	19	27	35	43	53

Table 13. *Percent yield reduction of soybeans as affected by nodes broken over (number of nodes broken over expressed as percent of total number of nodes).*

Growth Stage	Percent Nodes Broken Over						
	5	15	25	35	45	55	65
V1-Vⁿ	0	0	1	2	3	5	8
R1-R2	0	1	2	4	6	10	14
R2.5	1	3	6	9	11	16	20
R3	2	6	10	14	17	21	25
R3.5	2	8	13	18	23	28	33

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Maturity Changes in Corn and Soybeans

The last important question of a replant decision is, "What maturity corn hybrid should I plant?" and "How late of a soybean variety should I plant?"

Corn

Corn hybrids have the ability to adjust their maturity due to planting date. Iowa State did a study a few years ago documenting this. Corn hybrids adjust and "rush" to maturity faster the later the planting.

Table 14

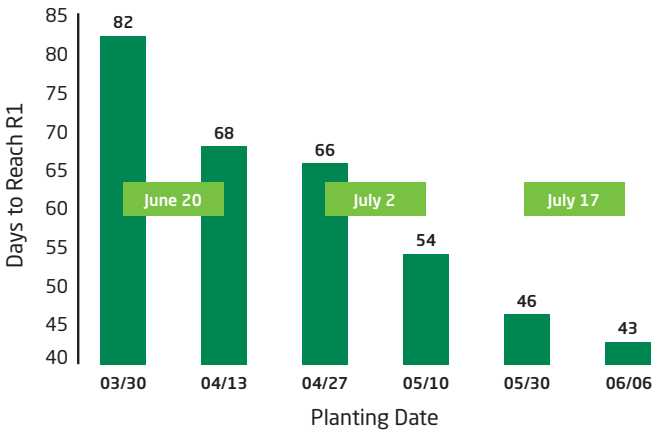
Location	Nashua (105 RM, 25333 GDD)			Lewis (110 RM, 2657 GDD)		
Planting Date	Days to Maturity	Maturity Date (R6)	Frost Risk % (<29° F)	Days to Maturity	Maturity Date (R6)	Frost Risk % (<29° F)
April 25	140	Sep 12	0	129	Sep 1	0
May 2	139	Sep 18	0	125	Sep 4	0
May 9	137	Sep 23	6	123	Sep 9	0
May 16	135	Sep 28	11	124	Sep 17	3

- **Hybrid Selection:** Consider a hybrid that is well adapted to the central Illinois environment. That means high daytime and nighttime temperature, periods of dry weather and periods of extreme wet weather. Do not plant an ultra-early hybrid like 105 day or earlier. Stick with 106 to 114 day products that fit your acres.
- **Population:** Consider your expected yield "best case" scenario. If you plant May 25, do you still expect 250 bu/ac? Do you expect 190 bu/ac? Adjust your seeding rates to those expected seeding levels.

Soybeans

Soybeans planted late also adjust their maturity to fit the season. March planted soybeans take twice as long to hit R1 as early June planted soybeans. Purdue University did a study on this and it is shown below.

Table 15



Number of days from planting to reach R1 (First Bloom) in West Lafayette.

Increase your seeding rates 10% - 20% over what you would normally plant in April or early May soybean plantings. Increasing the rate will ensure rapid growth early to close the rows and make sure all sunlight is captured by the plant and not the soil.

- Narrow rows are recommended. Late planted 30" row soybeans take nearly a month longer to canopy than narrow rows (15" or 7.5").
- Stick with varieties planned for your geography until the first week of June. Then focus on drought tolerant varieties that can perform in your area.

Making the Final Decision

Replanting can be an emotional and taxing decision for all parties involved. Please evaluate the facts of each field individually. BRANDT is dedicated to helping you make the final replant decision. An electronic version of this document can be found on our website.

Consult your BRANDT Professional to help with these decisions.

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