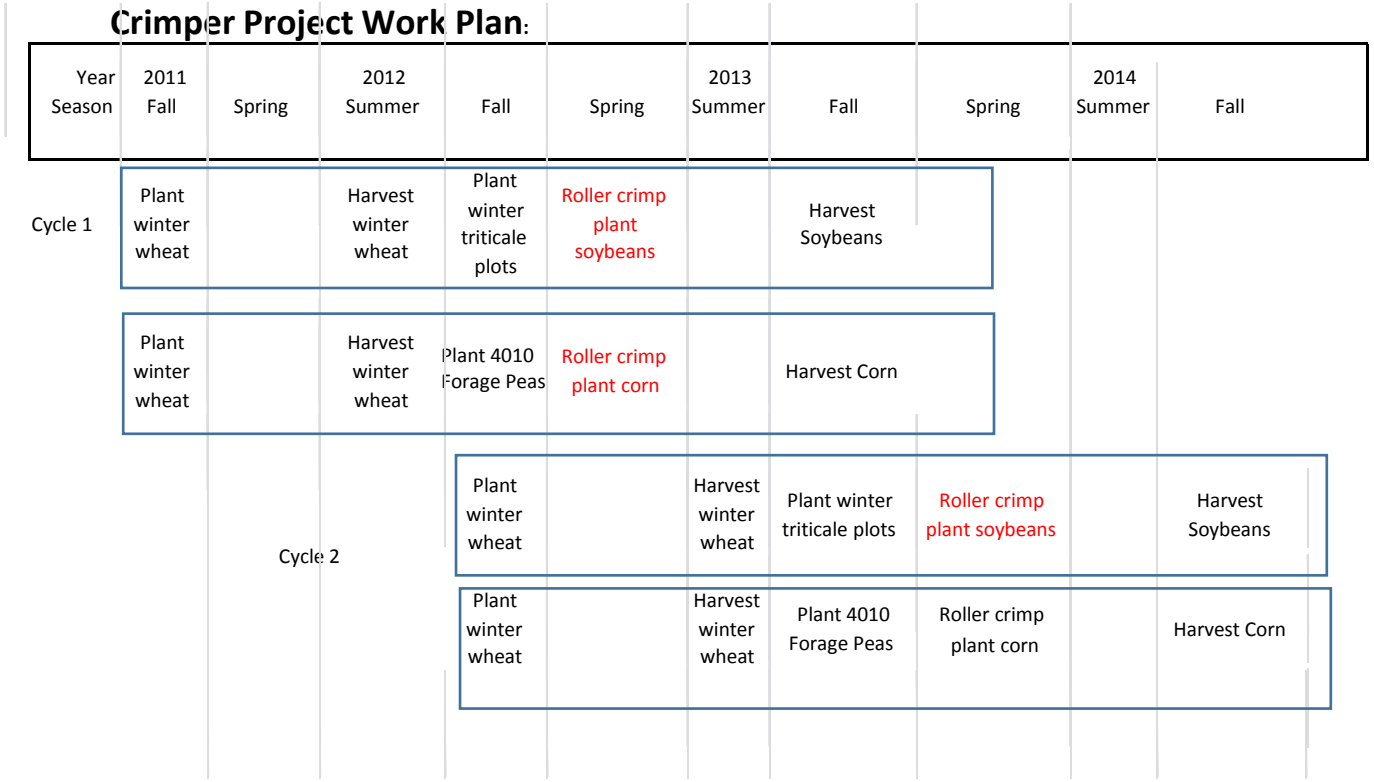

Figure 1. Conceptual timeline for the Rollar Crimper experiments.

Note: In 2013 fall conditions did not allow for cover crop planting so spring seeded oats and forage peas

Table 1. Treatments for the roller crimper timing study and the soil water gradient study. 2014 and 2015. HAL.

Soil moisture effect intended treatments:		**Actual treatments:**	
		2014	2015
Triticale Planting Rate	Water Rate		
1x= 60 lbs/acre	1w= 1 inch	7/18/2014	6/17/2015
2x= 90lbs/acre	2w= 2 inches	7/10/2014	6/10/2015
3x= 120 lbs/acre	3w= 3 inches	7/4/2014	6/8/2015
	none= no additional water added	7/21/2014	6/2/2015

Growth stage of cover crop at crimping was not the same since crimping was spread over ~ 2 weeks.

Revised Trts 2014	**Oats Soybean Experiment**			
	Oat Management			**Plant soybean**
	Crimp	**Mow**	**Disk**	
1=Plant row crop, mow week later	NA	10-Jul	NA	4-Jul
2= Mow then plant	NA	4-Jul	NA	4-Jul
3=Crimp, plant, mow week later	3-Jul	10-Jul	NA	4-Jul
4=Crimp post boot 1x	3-Jul	NA	NA	4-Jul
5=Crimp post boot 2x same direction	3-Jul	NA	NA	4-Jul
6=Crimp post boot 2x, N-S & S-N	3-Jul	NA	NA	4-Jul
7=Oats disk once	NA	NA	3-Jul	4-Jul
8=No oats planted disk once	NA	NA	3-Jul	4-Jul

	Pea Management			**Plant corn**
	Crimp	**Mow**	**Disk**	
1=Plant row crop, mow week later	NA	17-Jul	NA	10-Jul
2= Mow then plant	NA	10-Jul	NA	10-Jul
3=Crimp, plant, mow week later	10-Jul	17-Jul	NA	10-Jul
4=Crimp post boot 1x	10-Jul	NA	NA	10-Jul
5=Crimp post boot 2x same direction	10-Jul	NA	NA	10-Jul
6=Crimp post boot 2x, N-S & S-N	10-Jul	NA	NA	10-Jul
7=Oats/Peas disk once	NA	NA	10-Jul	10-Jul
8=No peas planted disk once	NA	NA	10-Jul	10-Jul

NA= Not applicable

Table 2. Cultural practices for 2014 roller crimper studies. HAL.

Field Location:		10B	Haskell Ag Lab	Legal: S22 T28N R4E
Crop:	Oats previous to soybeans, peas previous to corn and triticale in the borders. HAL, 2014.			
Previous Crop:		Forage peas & triticale		

Tillage	**Experiment**	**Date**	**Equipment**	**Details**
Field cult	All	4/23/2014	JD 6420 & 10 ft field cult	Work field with terraces
Harrow	All	4/23/2014	JD 6420 & Kovar harrow	
Field cult	All	5/5/2014	JD 6420 & 10 ft field cult	Work field across, short direction, EW
Field cult	All	5/19/2014	JD 5425 & 10 ft field cult	Work area around plots for planting triticale
Mow oat plots	Oat/soy	7/3/2014	JD 6420 & 7 ft rotary mower	2 pass on 10 ft plot
Disk oat plots	Oat/soy	7/3/2014	JD 4240 & 15 ft disk, harrow to shallow position, 1 pass	Mowed S-N, Oats N-S
Roller/crimp oats	Oat/soy	7/3/2014	JD 4020 & 10 ft roller crimper	Trt 6 N-S then S-N, Trt 5 both in same direction
Mow after crimp oats &2W	Oat/soy	7/10/2014	JD 6420 & 7 ft rotary mower	Mow trt 1 & 3, down middle of plots
Mow pea plots	Pea/corn	7/10/2014	JD 6420 & 7 ft rotary mower	
Disk pea plots	Pea/corn	7/10/2014	JD 4240 & 15 ft disk, harrow to shallow position, 1 pass	Mowed S-N, Peas N-S
Roller/crimp peas	Pea/corn	7/10/2014	JD 4020 & 10 ft roller crimper	Trt 6 N-S then S-N, Trt 5 both in same direction
Mow pea plots	Pea/corn	7/17/2014	JD 6420 & 7 ft rotary mower	Trts 1 & 3
Cultivate corn	Pea/corn	8/14/2014	JD 5425 & 4 row Buffalo cult	
Cultivate SB	Oat/soy	8/18/2014	JD 5425 & 4 row Buffalo cult	Plugged many times
Mow after crimp		7/17/2014	JD 6420 & 7 ft rotary mower	

Planting		**Date**	**Equipment**	**Variety**	**Rate**	**Depth**
Oats	Oat/soy	5/5/2014	Tye drill & JD 5425	Organic Jerry Oats	36, 54 & 72 lb/ac	1.5 inch
Forage peas	Pea/corn	5/5/2014	Tye drill & JD 5425	Welter Organic 4010 Forage Peas	60, 90,120 lb/ac	1.2 inch
Triticale, winter	Border	5/19/2014	Tye drill & JD 5425	Plant Triticale around oat plots		
Soybeans, both trials	Oat/soy	7/4/2014	JD 6420 & 4 row planter	Org Sb Blue River 12A2	149,785 sds/ac	1.2-1.5 inch
Corn	Pea/corn	7/10/2014	JD 6420 & 4 row planter	Org Corn Blue River 45R37	22,000 sds/ac	1.5-2.0 inch
SB 2W moist	Moist	7/10/2014	JD 6420 & 4 row planter	Org Sb Blue River 12A2	149,785 sds/ac	1.2-1.5 inch

SB 1W moist	Moist	7/18/2014	JD 6420 & 4 row planter	Org Sb Blue River 12A2	149,785 sds/ac	1.2-1.5 inch
SB None moist	Moist	7/21/2014	JD 6420 & 4 row planter	Org Sb Blue River 12A2	149,785 sds/ac	1.2-1.5 inch
Soil Sampling		**Date**	**Depths**	**No. cores/sample**		
Spring Peas N	Pea/corn	3/31/2015	0-12 inch	5 cores, For Nitrogen, selected plots only		
Spring Oats & Peas	Both	3/31/2015	0-8 inch	8 cores per rep		
Population:		**Date**	**No. of rows**	**Which rows**	**Length**	
SB pops	Oats/soy	8/8/2014	2 rows	Rows 2 & 3 or 3 & 4	Meter or 34 inch	
Corn pops	Pea/corn	8/5/2014	2 rows	Rows 2 & 3 or 3 & 4	Entire plot	
Weed/plant rating						
Corn plant/weed	Pea/corn	8/13/2014	Center rows of corn plots			
Soybean plant/weed	Oats/soy	8/14/2014	Center rows of soybean plots			
Plant Sampling		**Date**	**Stage**	**Separated into**		
Biomass Oats	Oats/soy	7/2&3/2014	Post boot, set seed	whole plant		
Soil H2O oats	Oats/soy	7/2/2014	Post boot, set seed	Depth of soil can, 1 per plot		
Biomass Peas	Pea/corn	7-8,9-14	Flower to pod fill/full	whole plant		
Biomass oats 2W	Moist	7/10/2014	Post boot, set seed	whole plant		
Soil H2O Peas	Pea/corn	7/10/2014	Flower to pod fill/full	Depth of soil can, 1 per plot, trt 4 only, all plant densities		
Biomass oats 1W	Moist	7/18/2014	Post boot, set seed	whole plant		
Oat & weed control ratings	oats/soy; Moist	8/13/2014				
Pea & weed control ratings	Pea/corn	8/14/2014				
Harvest		**Date**	**Method**	**No row**		
6 plant corn stover	Pea/corn	10-24&25-2014	6 plant by hand	Center 2 rows of plots		
Soybean grain	Oats/soy	10/29/2014	Almaco 20, bags	Center 2 rows of plots		
Clean grain	All	12-4&5-2014	Hand and fanning mill	weights, moisture, test wt if enough grain		

Table 3. Cultural practices for roller crimper soil moisture 2015 study. HAL.

Field Location:	Org. 10C, Top of hill on South end of field				
GPS 6-16-15		SW	42°22'54" N	96°57'24" W	Plot 101
		W by 304	42°22'55" N	96°57'24" W	
		SW center 301	42°22'55" N	96°57'24" W	
		NW	42°22'57" N	96°57'24" W	
		NE	42°22'57" N	96°57'22" W	
		SE	42°22'54" N	96°57'23" W	
Crop:	Triticale for forage/RC trial		**Previous Crop:**	Forage peas	

Tillage	**Date**	**Equipment**		**Comment**
Disk	9/16/2014	JD 6420 & 15 ft disk	Soil wet, disk 3 inch deep	
Disk	9/17/2014	JD 6420 & 15 ft disk	Surface dryer, try to level field	
Roller/Crimper	6/2/2015	4020 & I&J RC	RC (None trt)	
Roller/Crimper	6/8/2015	4020 & I&J RC	RC (3W trt)	
Roller/Crimper	6/10/2015	4020 & I&J RC	RC (2W trt)	
Roller/Crimper	6/17/2015	4020 & I&J RC	RC (1W trt)	
Mow between rows	7/10/2015	Husquvarna mower		
Mow alleys around plots	7/10/2015	JD 4310 & 4 ft mower	Cut alleys	
Mow between rows	8/10/2015	Husquvarna mower		

Planting	**Date**	**Equipment**	**Variety**	**Rate**	**Depth**
Plant Triticale	9-18&19-2014	JD 5425 & Tye drill	Cert. Org winter	Plots 60, 90, 120 lbs/ac, Bulk 90 lbs/a	1 inch
Plant soybeans, plots	6/19/2015	JD 6420 & 4 row planter	Blue River Org 2A12	130,000 k/a	1.5 inch

Soil Sampling	**Date**	**Depths**	**No. cores/sample**	
Soil Moisture (None)	6/2/2015	0-6 inch	4 cores/sample	
Soil Moisture (3W)	6/8/2015	0-6 inch	4 cores/sample	DW 6-10-15
Soil Moisture (2W)	6/10/2015	0-6 inch	4 cores/sample	

Soil Moisture (1W)	6/17/2015	0-6 inch	4 cores/sample	DW 6/22/2015
Crop Growth stages	**Emergence**	Triticale	9/25/2014	
		Soybean	6/26/2015	
Population:	**Date**	**No. of rows**	**Which rows**	**Length**
Ratings, weed control, kill	7/6/2015	Visual evaluation of kill/control		
Soybean pops	10/6/2015	2 rows,	rows 2 & 3	Meter
Soybean height	10/6/2015	Average for rows 2 & 3		
Plant Sampling	**Date**	**Stage**	**Separated into**	
Plant height	6/2/2015	Heading		
Harvest	**Date**	**Method**	**No row**	
Biomass (None)	6/2/2015	Heading	1/4 meter square	
Biomass (3W)	6/8/2015	Heading, flowering	1/4 meter square	
Biomass (2W)	6/10/2015	Heading, flowering	1/4 meter square	
Dry wts (none)	6/15/2015			
Biomass (1W)	6/17/2015	Seed fill	1/4 meter square	
Dry wts (2W, 3W)	6/24/2015			
Dry wts (1W)	6/20/2015			
Soybean plots R/C	10/21/2015	Almaco 20	Bagged sb, put w/ conventional	
Soybean bulk/borders	10/21/2015	JD 6620	Put in wagon #3	
Post Harvest work:	**Date**			
Triticale & weed control, soybean stand	7/6/2015	Visual evaluation		

Table 4. Daily precipitation at the Haskell Agriclutural Laboratory, 2014.

NOAA weather station

Day	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
					inches							
1	0.30				0.05	0.34	0.01		0.37			
2			0.13					0.59		0.56		
3		T		0.42		0.81						
4								0.29				
5						0.63	1.93	1.49	0.02	0.01		
6						0.11		0.08				
7		T		0.26		0.24	0.01	0.26				
8					0.25			0.01	0.06	0.03		
9						0.56			0.06			
10									0.23			
11							1.16		0.14		T	
12		0.10	0.10		0.60		0.99		0.39	0.06		
13					0.08					0.02		
14				0.25		4.00						
15						0.01		0.01				0.84
16		T				0.43					0.38	
17						1.77						
18												
19			T						0.07			
20		T				0.12		0.26	0.28			
21		0.15		0.18		0.03						
22						1.22		0.02		0.47		
23								0.69	0.26	0.01		
24							0.03	0.10	0.01			
25		0.42			0.08							
26					0.75		0.06					
27			0.02		0.06	0.56		0.59				
28			0.03	0.10	0.01	0.40		0.62	0.93			
29				0.95		0.25		1.17				
30				0.11	0.41	1.26			0.10			
31					0.34			1.02				
Total	0.30	0.67	0.28	2.27	2.63	12.74	4.19	7.20	2.92	1.16	0.38	0.84
Annual total		**35.6**										

Table 5. Daily precipitation at the Haskell Agriclutural Laboratory, 2015.

NOAA weather station

Day	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
	---------- inches ----------											
1					0.15		0.23					0.26
2		0.6		0.14			0.05					0.09
3					0.37	0.28						
4	0.1				0.2			0.48	0.23			
5					0.11		0.24					
6	0.07				0.29	2.8	0.47	0.03	0.02			
7					0.03	0.02						
8								0.07	0.7			
9	T			0.01	0.02				0.04			
10				0.31	0.58	0.56						
11						0.34					0.58	
12				0.48								
13				0.53	0.12		0.05					
14					0.38				0.02			1.11
15					0.02	0.61	0.42					0.1
16							0.21				0.44	0.13
17					0.05		0.86	0.96			0.39	
18				0.39		0.06	0.27	0.68	0.36			
19												
20					0.11		1.06					
21						0.03						
22					0.05				0.12			
23					0.03				4.1		0.19	
24				0.02	0.13	0.09			1.35	0.54		
25			0.68		0.08				0.05			
26	0.08				0.08	0.16	0.51	0.04				
27								0.17				
28							1.26					
29					0.06							
30					0.01	0.17					0.16	
31								0.01				
Total	0.25	0.60	0.68	1.88	2.87	5.12	5.63	2.44	6.99	0.54	1.76	1.69
Annual total		**30.5**										

Table 6. The ANOVA for the effect of roller crimping oats planted at 3 seeding rates. 2014. HAL.

Variable:	Oats DM	Oats DM	Soy Pop	Sb Vigor	Termination of these plant categories: Oats	Grass Weeds	Broadleaf Weeds	soybean	Soil H2O
	%	lbs/acre	plants/ac		%	%	%	bu/ac	%
	Prob. > F								
Rep									
Termination(T)	0.26	0.0005	0.0312	0.0001	0.0001	0.0875	0.5727	0.003	0.074
Seeding Rate (SR)	0.35	0.078	0.1729	0.2334	0.3091	0.0038	0.2317	0.4287	0.8566
T x SR	0.10	0.334	0.6587	0.3783	0.1529	0.1981	0.0027	0.6322	0.0988
CV (%)	9.7	15.1	13.2	8.4	11.3	24.9	8.5	38.1	12.1
LSD 0.05									
T	4.2	121	NE	1.13	18.8	16	24.4	1.78	NE
SR	1.2	56.1	NE	0.151	4.4	7.5	3.57	0.48	NE

TRT	DM pct	DM lbs/ac	Soy Pop	sbvigor	Termination of these plant categories: Oats	Grass Weeds	Broadleaf Weeds	soybean	Soil H2O
1=Plant row crop, mow week later	23.4	809	88602	4.08	89.8	64.2	90.4	2.89	24.2
2= Mow then plant	25.1	754	87716	3.17	96.4	56.3	71.7	2.18	23.9
3=Crimp, plant, mow week later	27.0	748	99321	2.83	65.4	59.2	84.2	1.63	20.0
4=Crimp post boot 1x	23.2	826	81190	2.25	55.8	65.4	85.8	0.52	25.7
5=Crimp post boot 2x same direction	25.4	747	92461	2.83	63.8	66.7	83.3	2.01	24.5
6=Crimp post boot 2x, N-S & S-N	27.2	679	108430	3.00	63.8	47.9	86.3	1.13	23.1
7=Oats disk once	22.7	829	98940	5.25	89.5	71.3	93.3	4.74	25.5
8=No oats planted disk once	25.2	516	92065	5.25	100.0	52.1	73.3	4.84	23.3
Mean	24.9	739	93591	3.6	78.1	60.4	83.5	2.5	23.8
Comparisons (a vs b):	a - b	a - b	a - b	a - b	a - b	a - b	a - b	a - b	a - b
No Cover Crop vs others > than LSD	0.4	-254	-1743	1.9	25.1	-9.5	-11.7	2.7	-0.5
Crimp vs other > than LSD	1.9	-47.4	3598	-1.4	-29.7	-4.1	-0.2	-1.9	-1.2

Seeding Rate (SR)	DM pct	DM lbs/ac	Soy Pop	sbvigor	Termination of these plant categories: Oats	Grass Weeds	Broadleaf Weeds	soybean	Soil H2O
1x	24.8	720	97081	3.53	78.6	52.8	82.8	2.3	23.6
2x	24.5	720	91774	3.66	76.2	65.3	82.5	2.6	23.8
3x	25.4	776	91917	3.56	79.4	63.0	85.3	2.6	23.9
Max - Min > than LSD	0.87	56	5307	0.13	3.3	12.5	2.8	0.3	0.3
LSD 0.05 SR	1.2	56	NE	0.15	4.4	7.5	3.6	0.5	31

trt	Seeding Rate (SR)	DM pct	DM lbs/ac	sbpop	sbvigor	Termination of these plant categories			soybean	Soil H2O
						Oats	Grass Weeds	Broadleaf Weeds		
1	1x	21.8	820	96692	4.3	86	63	90	2.7	24.3
1	2x	23.1	825	83229	4.0	91	65	90	3.1	24.4
1	3x	25.5	784	85885	4.0	92	65	91	2.9	24.0
2	1x	25.4	747	91072	3.3	94	59	71	1.9	24.7
2	2x	24.4	701	83553	3.3	98	59	74	1.6	23.9
2	3x	25.5	814	88524	3.0	98	51	70	3.0	23.0
3	1x	29.9	598	104982	2.5	78	43	95	1.1	20.9
3	2x	25.5	783	98035	3.0	55	73	70	2.0	16.4
3	3x	25.6	865	94947	3.0	64	63	88	1.8	22.8
4	1x	21.2	825	85959	2.0	58	50	79	0.5	27.7
4	2x	23.8	779	78150	2.5	51	73	85	0.6	25.1
4	3x	24.5	874	79462	2.3	59	74	94	0.5	24.2
5	1x	25.7	719	97016	2.8	64	60	76	1.6	24.5
5	2x	24.9	771	90516	3.0	60	76	88	2.2	24.8
5	3x	25.4	751	89852	2.8	68	64	86	2.2	24.4
6	1x	26.4	667	100242	3.0	68	28	88	0.8	22.6
6	2x	27.2	698	115511	3.0	61	63	84	1.0	23.6
6	3x	28.1	672	109536	3.0	63	54	88	1.7	23.1
7	1x	21.6	847	108718	5.3	82	70	94	4.8	24.2
7	2x	23.9	752	89621	5.3	93	70	94	5.3	26.8
7	3x	22.6	888	98482	5.3	93	74	93	4.2	25.6
8	1x	26.5	534	91967	5.3	100	51	70	5.2	20.1
8	2x	23.4	455	95580	5.3	100	45	76	4.8	25.6
8	3x	25.8	561	88648	5.3	100	60	74	4.6	24.2

Table 7. The ANOVA for the effect of roller crimping forage peas at 3 seeding rates. 2014. HAL.

Variable:	Pea DM	DM	Corn following peas	Termination of grass and broad leaf weeds		Stover DM	Corn stover 100% DM	Soil H20
	%	lbs/ac	plts/ac	%	%	%	lbs/acre	%
	Prob. > F							
Rep								
Termination (T)	0.0001	0.0001	0.0035	0.0002	0.014	0.0012	0.0499	---
Seeding Rate (SR)	0.16	0.077	0.516	0.0001	0.0001	0.205	0.0398	0.0244
T x SR	0.296	0.448	0.609	0.1295	0.0022	0.4327	0.3026	---
CV (%)	7.3	13.97	16	16.4	8.5	7.3	22.2	4.7
LSD 0.05								
T	1.42	109.9	NE	13.2	10.8	1.82	988	---
SR	0.61	46.4	NE	5.8	3.6	0.93	283	1.8

trt	DMpct	DMlba	popa	Grass	Broadleaf	Corn DM	corn above ground DM lb/ac	Soil H20
	%	lbs/ac	plts/ac	%	%	%	lbs/acre	%
1=Plant row crop, mow week later	15.4	723	10864	75.8	92.1	24.3	2209	
2= Mow then plant	15.9	631	18281	70.4	80.9	26.6	2841	
3=Crimp, plant, mow week later	17.8	804	14678	56.3	89.2	25.0	1818	
4=Crimp post boot 1x	14.9	690	10601	54.2	82.5	24.2	1826	22.4
5=Crimp post boot 2x same direction	15.7	683	14283	61.3	85.0	25.7	2578	
6=Crimp post boot 2x, N-S & S-N	15.5	732	14362	76.3	70.8	23.1	2831	
7=Oats disk once	15.4	660	15414	85.0	89.2	26.5	3235	
8=No oats planted disk once	23.2	367	17414	83.3	88.8	27.3	2946	
Mean	16.7	661	14487	70.3	84.8	25.3	2535	
Comparisons (a vs b):	a - b	a - b	a - b	a - b	a - b	a - b	a - b	
No Cover Crop vs others > than LSD	7.4	-337	3344	14.9	4.5	2.2	469	
Crimp vs other > than LSD	0.4	55.4	-1372	-15.1	-5.5	-1.3	-499	
crimp2x or Crmp and mow			14441				2704	882

Seeding Rate (SR)	Pea DMpct	Pea DMlba	corn popa	Grass	Broadleaf	Corn DM	corn above ground DM lb/ac	Soil H20
	%	lbs/ac	plts/ac	%	%	%	lbs/acre	%
1x	17.0	690	14283	63	79	25.5	2398	21.9
2x	16.7	657	14303	69	84	25.7	2463	24.0
3x	16.4	637	14875	79	91	24.9	2746	21.2
Max - Min > than LSD	0.59	53	592	16	12	0.80	348	2.8
LSD 0.05 SR > than LSD	0.61	46	NE	5.8	3.6	0.93	283	1.8

trt	Seeding Rate (SR)	DMpct	DMlba	popa	Termination of grass and broad leaf weeds		Corn DM	corn above ground DM lb/ac
		%	lbs/ac	plts/ac	%	%	%	lbs/acre
1	1x	15.7	748	10338	65.0	88.8	25.1	2014
1	2x	15.5	728	10574	78.8	92.5	24.4	2178
1	3x	15.0	692	11679	83.8	95.0	23.4	2435
2	1x	16.5	649	16966	58.8	75.0	26.0	2494
2	2x	15.6	619	19886	76.3	80.8	26.7	2944
2	3x	15.8	626	17992	76.3	87.0	27.3	3086
3	1x	18.7	915	14914	56.3	90.0	24.2	1686
3	2x	17.8	739	13336	46.3	86.3	26.7	1518
3	3x	16.9	757	15783	66.3	91.3	24.1	2252
4	1x	15.0	761	10101	41.3	76.3	24.5	1776
4	2x	15.3	637	11758	47.5	80.0	24.2	2031
4	3x	14.5	671	9943	73.8	91.3	23.8	1671
5	1x	16.5	666	14441	48.8	78.8	24.9	2191
5	2x	16.0	717	13889	56.3	85.0	25.5	2383
5	3x	14.7	664	14520	78.8	91.3	26.7	3160
6	1x	15.6	738	14915	70.0	50.0	23.8	2455
6	2x	15.0	788	14283	75.0	73.8	23.2	3110
6	3x	15.8	670	13889	83.8	88.8	22.3	2927
7	1x	16.0	632	14757	80.0	86.3	27.5	3252
7	2x	15.0	670	14204	88.8	88.8	27.4	3139
7	3x	15.1	678	17282	86.3	92.5	24.7	3315
8	1x	22.0	410	17835	83.8	88.8	28.0	3318
8	2x	24.0	354	16493	80.0	87.5	27.2	2401
8	3x	23.6	335	17914	86.3	90.0	26.6	3119

Table 8. The ANOVA for the effect of soil water levels and seeding rate. 2014. HAL.

Variable:	Oats DM	Oats 100% DM	Soybean Pop	Soil Moisture					Termination of these plant categories			Volunteer Oat	Grass Late	Broad Late
									Oats	Grass	Broadleaf			
	%	lbs/ac		0-3"	3-6"	6-9"	9-12"	0-6"	%	%	%		%	%
		Prob. > F												
Rep														
Water Regime(WR)	0.6073	0.0305	0.0032	0.0359	0.0718	0.824	0.8039	0.0242	0.2787	0.3182	0.5662	0.0746	0.0299	0.265
Seeding Rate (SR)	0.3797	0.0823	0.7024	0.5179	0.5711	0.8761	0.0274	0.8812	0.0001	0.0001	0.1259	0.2282	0.0116	0.1503
WR x SR	0.0056	0.5223	0.8157	0.3222	0.2083	0.344	0.9507	0.3111	0.3157	0.1676	0.1037	0.8386	0.6545	0.1402
CV (%)	8.5	14.4	31.5	16	9.6	6	3	9.93	14.5	11.99	9.59	31.5	21.1	15.9
LSD 0.05														
Water Regime	3.6	188	33160	3.4	1.8	11.5	1.9	2.3	9.4	10.6	9.93	29.9	15.3	24.9
Seeding Rate	1.8	97	13081	2.2	1.3	15.3	0.4	1.3	8.2	6.33	6.61	12.5	10	10.7

Water Regime	Crimp date	Oats DM	Oats DM	SoyPop	0-3"	3-6"	6-9"	9-12"	0-6"	Oats	Grass	Broadleaf	Volunteer Oat	Grass late	Broad late
		%	lbs/ac	plts/ac	%	%	%	%	%	%	%	%			
1W	18-Jul	28.1	1115	34972	17.5	18.1	18.4	18.0	17.8	80.0	74.6	96.3	47.5	65.8	97.8
2W	10-Jul	28.0	1111	72157	18.3	18.3	18.0	17.5	18.3	72.5	67.1	90.6	68.3	59.6	77.7
3W	4-Jul	28.5	816	95398	21.9	19.4	18.2	17.9	20.6	76.3	75.8	95.6	65.8	55.8	95.1
None (driest)	21-Jul	30.0	1074	24790	16.9	16.9	17.6	18.3	16.9	80.0	72.1	95.6	36.7	79.6	97.8
Mean		28.6	1029	56829	18.6	18.2	18.1	18.0	18.4	77.2	72.4	94.5	54.6	65.2	92.1
Max - Min	> than LSD	2.0	299	70608	5.0	2.5	0.8	0.8	3.8	7.5	8.8	5.7	31.7	23.8	20.2

Seeding Rate (SR)	Oats DM	Oats DM	SoyPop	0-3"	3-6"	6-9"	9-12"	0-6"	Oats	Grass	Broadleaf	Volunteer Oat	Grass late	Broad late
	%	lbs/ac	plts/ac	%	%	%	%	%	%	%	%		%	%
1 (36 lbs/ac)	27.9	962	53952	19.2	17.8	18.0	17.7	18.5	62.8	58.4	94.4	59.4	57.5	91.8
2 (54 lbs/ac)	29.0	1040	57272	18.7	18.3	18.1	18.0	18.5	85.0	77.2	91.1	48.8	73.4	87.0
3 (72 lbs/ac)	28.9	1084	59264	18.0	18.4	18.1	18.2	18.2	83.8	81.6	97.9	55.6	64.7	97.5
Max - Min > than LSD	1.1	122	5312	1.2	0.6	0.2	0.5	0.3	22.2	23.1	6.8	10.6	15.9	10.5

Water regime	Seeding Rate (SR)	Oats DM %	Oats DM lbs/ac	SoyPop plts/ac	0-3" %	3-6" %	6-9" %	9-12" %	0-6" %	Oats %	Grass %	Broadleaf %	Volunteer Oat	Grass late %	Broad late %
1W	1	27.4	1077	36521	17.5	18.4	18.4	17.9	18.0	62.5	60.0	93.8	53.8	51.3	99.0
1W	2	27.1	1173	30545	17.9	18.4	18.6	17.9	18.2	88.8	76.3	97.0	38.8	75.0	98.0
1W	3	29.7	1095	37849	17.0	17.5	18.2	18.3	17.2	88.8	87.5	98.0	50.0	71.3	96.5
2W	1	26.3	1063	63746	17.6	17.3	18.0	17.2	17.4	57.5	50.0	96.8	73.8	53.8	74.3
2W	2	29.3	1088	81675	20.2	17.5	17.9	17.6	18.9	85.0	78.8	76.8	58.8	71.3	59.8
2W	3	28.4	1182	71051	17.2	19.9	18.1	17.7	18.6	75.0	72.5	98.3	72.5	53.8	99.0
3W	1	31.4	658	89643	24.8	19.7	18.8	17.6	22.2	57.5	60.0	96.0	75.0	47.5	97.0
3W	2	27.8	878	93628	20.5	19.9	18.1	18.0	20.2	87.5	83.8	92.8	57.5	61.3	92.3
3W	3	26.3	911	102924	20.3	18.6	17.8	18.1	19.5	83.8	83.8	98.0	65.0	58.8	96.0
None	1	26.6	1052	25897	17.0	15.7	16.6	17.9	16.4	73.8	63.8	91.3	35.0	77.5	97.0
None	2	32.0	1023	23241	16.1	17.2	17.8	18.5	16.7	78.8	70.0	98.0	40.0	86.3	98.0
None	3	31.3	1149	25233	17.4	17.7	18.4	18.7	17.6	87.5	82.5	97.5	35.0	75.0	98.5

Table 9. The ANOVA for the effect of soil water levels and seeding rate. 2015. HAL.

Variable:	Triticale DM	Triticale 100% DM	Termination Triticale	Termination Weeds	Soybean stand	Soil H2O 0-6"	Soybean pop	Soybean ht.	Soybean yield	Triticale ht
	%	lbs/ac	%	%	%	%	plts/ac	inches	bu/ac	m
					Prob. > F					
Rep										
Water Regime(WR)	0.0001	0.0002	0.0248	0.0303	0.6382	0.0001	0.9006	0.0988	0.0013	0.4045
Seeding Rate (SR)	0.0136	0.8855	0.0504	0.0001	0.6236	0.0008	0.9072	0.002	0.0011	0.0008
WR x SR	0.4101	0.5829	0.0769	0.9785	0.2535	0.8393	0.0747	0.041	0.4616	0.6118
CV (%)	8.5	30.8	8.7	39.9	18	2.64	22.9	7.56	22.6	6.3
LSD 0.05										
Water Regime	2.3	140	22	16	26	2.0	22841	3.0	3.0	0.18
Seeding Rate	1.6	180	6	16	10	0.5	12426	1.2	3.0	0.06

Water Regime

Moisture Level	Crimp date	DM %	DMlba	tritkill	weedkill	sbstand	soil H2O 0-6"	soy plants/ac	Soybean ht.	Soy bu/ac	Triticale ht. m
1W	17-Jun	32.2	984	98	67	72	26.1	75034	21.5	19.5	1.33
2W	10-Jun	25.8	855	96	63	68	23.3	71272	21.7	17.5	1.30
3W	8-Jun	26.4	839	92	76	75	27.4	78354	23.3	21.7	1.40
None	2-Jun	21.0	518	65	50	83	18.3	72599	19.4	13.7	1.27
Mean		26.4	799	88	64	75	23.8	74315	21.5	18.1	1.3
Max - Min	> than LSD	11.2	465	34	26	15	9.1	7082	3.8	8.0	0.1

Seeding Rate

	DM %	DMlba	tritkill	weedkill	sbstand	soil H2O 0-6"	soy plants/ac	Soybean ht.	Soy bu/ac	Triticale ht. m
60 lbs/ac	25	782	84	41	77	23.2	73043	20.3	15.0	1.26
90 lbs/ac	27	823	88	73	73	23.9	74205	21.6	18.0	1.32
120 lbs/ac	27	792	91	77	74	24.2	75699	22.6	21.3	1.39
Max - Min > than LSD	2.5	41.0	7	37	5	0.9	2656	2.3	6.3	0.1

Moisture Level	Seeding Rate	DM %	DMlba	tritkill	weedkill	sbstand	soil H2O 0-6"	soy plants/ac	Soybean ht.	Soy bu/ac	Triticale ht. m
1W	60	30.9	968	98	45	76	25.6	77027	21.5	18.3	1.26
1W	90	32.7	995	98	81	64	26.2	79683	22.3	20.6	1.33
1W	120	33.1	988	99	75	75	26.4	68394	20.8	19.5	1.40
2W	60	22.8	634	92	39	78	22.7	83003	21.0	17.5	1.21
2W	90	27.4	901	98	74	71	23.7	69059	20.8	16.8	1.31
2W	120	27.0	969	98	76	56	23.6	61754	23.3	21.1	1.38
3W	60	25.1	847	92	54	76	26.7	78355	21.8	18.0	1.38
3W	90	26.0	934	95	84	69	27.5	71714	23.3	20.3	1.42
3W	120	28.2	737	90	90	80	28.1	84995	24.8	27.0	1.42
None	60	21.0	619	54	26	79	18.0	53786	16.8	9.3	1.19
None	90	20.6	463	63	54	86	18.4	76362	20.0	14.3	1.24
None	120	21.5	474	77	69	85	18.6	87651	21.5	17.5	1.37

Appendix Table 1. Soil sample results for the three roller crimper experiments. March 31, 2015; 0-8 in; 8 cores/rep; average of 4 reps

Soil Parameter (units)	Peas 2014	Oats 2014	Soil Moisture 2014
1:1 Soil pH	6.3	6.6	6.7
WDRF Buffer pH	6.9	7.1	7.1
1:1 S Salts (mmho/cm)	0.3	0.3	0.3
Excess Lime	None	None	None
Texture No		silt loam	
Organic Matter LOI (%)	3.1	3.4	3.4
Nitrate-N (ppm N)	9	10	5
lbs N/A	21	24	13
Potassium (ppm K)	230	229	252
Sulfate-S (ppm S)	13	13	13
Zinc ppm (Zn)	3.7	1.7	1.5
Iron (ppm Fe)	46	36	36
Manganese (ppm Mn)	17	14	14
Copper (ppm Cu)	1.6	1.4	1.2
Calcium (ppm Ca)	2908	2961	2668
Magnesium (ppm Mg)	587	561	476
Sodium (ppm Na)	10	11	8
Boron (ppm B)	0.64	0.71	0.73
CEC/Sum of Cations (me/100g)	21.8	20.5	18.3
%H Sat	7.8	2.0	1.8
%K Sat	2.8	3.0	3.8
%Ca Sat	66.8	72.3	72.8
%Mg Sat	22.5	22.8	21.5
%Na Sat	0	0	0
Mehlich P-III (ppm P)	48	58	87