

SUGARCANE WEED MANAGEMENT

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Control of Itchgrass with Preemergence Herbicides in Spring. On February 20, 2018, three itchgrass (*Rottboellia cochinchinensis*) preemergence herbicide studies were initiated in ratoon sugarcane at Jason Richard Farms in St. Charles, LA. Prior to the application of the preemergence herbicide treatments, the experimental site was sprayed with a combination of Gramoxone[®] (3 pt/a) + Brash[®] (1.5 pt/a) + Induce[®] (0.25% v/v). A randomized complete block experimental design was used for all studies, treatments were replicated 4 times, and the plot size was 6 ft. X 40 ft. One-half inch of rainfall was received 3 days after application. Itchgrass emergence was counted in the entire plot, 3 weeks after application (WAA) of the herbicide treatments.

Study 1: In the first study, pendimethalin (3 qt/a) + metribuzin (3 lb/a) and pendimethalin (3 qt/a) + hexazinone (Velossa[®]) (2 pt/a) controlled 93 and 95% of itchgrass, respectively, 3 WAA (Table 1). Itchgrass control was numerically greater for the pendimethalin treatment formulated as an emulsifiable concentrate compared to the micro-encapsulated suspension (88 vs 77%). The metribuzin (3 lb/a) and hexazinone (2 pt/a) treatments provided poor control of itchgrass, and controlled 42 and 37%, respectively 3 WAA.

Study 2: The second study evaluated the potential new herbicide, Alion[®] (indaziflam) at 3.75, 6.5, and 9.25 oz/a. Alion[®] at 6.5 and 9.25 oz/a controlled 43 and 68 % of itchgrass at 3 WAA, respectively (Table 2). Prowl 3.3 EC[®] was applied at 3.6 qt/a and provided 94% itchgrass control.

Study 3: The third study evaluated tank-mixes in combination with Lumax EZ[®] (S-metolachlor + atrazine + mesotrione) to control itchgrass. Treatments included Lumax EZ[®] (2 qt/a) + Prowl 3.3 EC[®] (2 qt/a), Lumax EZ[®] (2 qt/a) + Prowl 3.3 EC[®] (3 qt/a), Lumax EZ[®] (2 qt/a) + Command[®] (3 pt/a), and Lumax EZ[®] (2 qt/a) + Velossa[®] (2 pt/a). The Lumax EZ[®] + Prowl[®] (3 qt/a) and Lumax EZ[®] + Command[®] treatments, provided 91 and 93% control of itchgrass 3 WAA (Table 3). The Lumax EZ[®] + Velossa[®] treatment provided moderate itchgrass control (59%).

Postemergence Management of Italian Ryegrass

A study was initiated on March 8, 2018, at Bain Farms in Cheneyville, LA to evaluate several postemergence herbicides ability to manage Italian ryegrass (*Lolium multiflorum*). At the time of treatment, Italian ryegrass was 6 – 10 inches tall and sugarcane was 4 inches tall. A randomized complete block experimental design was used for the study, treatments were replicated 4 times, and the plot size was 6 ft. X 40 ft. Herbicide treatments included Axial XL[®] (pinoxaden) at 16.4

oz/A, Evik[®] (ametryn) at 1 lb/a, Envoke[®] (trifloxysulfuron-sodium) at 0.5 oz/a, Asulam[®] at 4 qt/a, and Gramoxone[®] (paraquat) at 3 pt/a. Non-ionic surfactant was added to all treatment at 0.25% v/v. At 4 WAA, sugarcane injury was noted for the Axial XL[®] treatment; resulting in a reddening of the sugarcane leaf. Italian ryegrass control was poor for all herbicide treatments (<54%) except or Gramoxone[®], which provide 87% control 4 WAA (Table 4).

Tolerance of Sugarcane to XDE-848 BE. A study was initiated at Sugar Research Station in St. Gabriel, LA to investigate sugarcane tolerance to the experimental compound XDE-848 BE. No sugarcane injury was noted 2 WAA, and grass and broadleaf weed postemergence control was poor.

Control of Itchgrass with Preemergence Herbicides At-Planting. On August 17, 2018, a preemergence herbicide study was conducted in newly planted sugarcane to evaluate the ability of pendimethalin and hexazinone to control itchgrass at Ralph Babin Farms in Raceland, LA. A randomized complete block experimental design was used for all studies, treatments were replicated 4 times, and the plot size was 6 ft. X 40 ft. One inch of rainfall was received 30 minutes after application. Itchgrass emergence was counted in the entire plot at 2, 3, and 4 weeks after application (WAA) of the herbicide treatments. Herbicide treatments included pendimethalin 3.3 EC at 2.4, 3, 3.6 qt/a, hexazinone 2.4L at 1.5, 2.2, and 2.9 pt/a, hexazinone + HM9679A at 2.2 pt/a + 1% v/v, and hexazinone + triclopyr 2.87ae/gal at 2.2 pt/a + 1.4 qt/a. At 4 WAA, itchgrass plants were counted. Pendimethalin at 2.4, 3, 3.6 qt/a controlled 74, 71, and 78% of itchgrass plants respectively, whereas hexazinone treatments at 1.5, 2.2, and 2.9 pt/a controlled 41, 50, and 57% of itchgrass plants respectively (Table 5).

Tolerance and Efficacy of Sugarcane to the Experimental Herbicide H1168aa. A study was initiated in newly planted sugarcane to evaluate the tolerance and efficacy of sugarcane to the experimental herbicide H1168aa. L 01-299 was planted on August 24th at Sugar Research Station in St. Gabriel, LA and injury and weed control was recorded 4 WAA. A randomized complete block experimental design was used for the study, treatments were replicated 4 times, and the plot size was 6 ft. X 40 ft. Herbicide treatments included H1168aa at 10.2, 14.3, and 20.4 oz/a, Atrazine[®] at 4 qt/a, Prowl H2O[®] at 3.2 qt/a, TriCor[®] + Command[®] at 1 lb/a + 3.3 pt/a, TriCor[®] + Velpar DF[®] at 2 lb/a + 10.7 oz/a, H1168aa + TriCor[®] at 10.2 oz/a + 2 lb/a, H1168aa + Prowl H2O[®] at 10.2 oz/a + 3.2 qt/a, H1168aa + Velpar DF[®] at 10.2 oz/a + 10.7 oz/a, H1168aa + Command[®] at 10.2 oz/a + 3.3 pt/a, H1168aa + TriCor[®] at 14.3 oz/a + 2 lb/a, H1168aa + Prowl H2O[®] at 14.3 oz/a + 3.2 qt/a, H1168aa + Velpar DF[®] at 14.3 oz/a + 10.7 oz/a, and H1168aa + Command[®] at 14.3 oz/a + 3.3 pt/a. Injury averaged 8.5% for H1168aa (14.3, and 20.4 oz/a), and barnyardgrass (*Echinochloa crus-galli*), crabgrass (*Digitaria sanguinalis*), browntop millet (*Urochloa ramosa*), seedling johnsongrass (*Sorghum halepense*), and ivyleaf morningglory (*Ipomoea hederacea*) control was at least 97% (10.2, 14.3, and 20.4 oz/a) (Table 6). H1168 provided similar grass control as Prowl H2O[®] and broadleaf control as Atrazine[®]. Mixtures of H1168aa with TriCor[®], Prowl H2O[®], Velpar DF[®], or Command[®] did not improve weed control, but injury averaged 12% when H1168aa was mixed with Command[®].

Impact of Fomesafen on Newly Planted Sugarcane. A study was initiated to evaluate the impact of fomesafen (Flexstar[®]) on newly planted sugarcane. L 01-299 was planted on August

21, 2018 at the Sugar Research Station in St. Gabriel, LA and Flexstar[®] was applied following planting at 0.75, 1.5, 3, and 6 pt/a. A randomized complete block experimental design was used for the study, treatments were replicated 4 times, and the plot size was 18 ft. X 30 ft. Shoots were counted and % injury was recorded at 4 and 9 WAA. Average shoot height was also recorded at 9 WAA. No differences in the number of shoots per plot were noted among the treatments at 4 WAA, however the 3 and 6 pt Flexstar[®] treatments injured sugarcane 9 and 16%, respectively (Table 7). Shoots/plot were reduced 9 WAA for the 6 pt Flexstar[®] treatment and injury averaged 11%. Shoot height was reduced by approximately 1.1 and 1.6 inches for the 3 and 6 pt Flexstar[®] treatments, respectively when compared to the check.

Table 1. Mean percentage PRE control of itchgrass in stubble sugarcane in Raceland, LA in 2018.

Treatment ¹	Rate/a	# of itchgrass/plot	% Control
		-----3 WAA ² -----	-----
Metribuzin	3 lb	221 ab ³	42
Pendimethalin (MS ⁴)	2.6 qt	87 bc	77
Pendimethalin (EC)	3 qt	46 cd	88
Hexazinone ⁵	2 pt	243 ab	37
Pendimethalin (EC) + Metribuzin	3 qt + 3 lb	28 d	93
Pendimethalin (EC) + Hexazinone	3 qt + 2 pt	19 d	95
Hexazinone + Metribuzin	2 pt + 3 lb	131 abc	66
Hexazinone + Triclopyr	2 pt + 1.4 qt	83 bc	78
Check		383 a	

¹ Treatments applied 2/20/2018.

² WAA = Weeks After Application.

³ Means within a column followed by the same lowercase letter are not significantly different at P=0.05.

⁴ Pendimethalin Formulation: MS = micro-encapsulated suspension, EC = emulsifiable concentrate.

⁵ Hexazinone = 2.4 lb/gal.

Table 2. Mean percentage PRE control of itchgrass in stubble sugarcane in Raceland, LA in 2018.

Treatment ¹	Rate/a	# of itchgrass/plot	% Control
		-----3 WAA ² -----	-----
Alion [®]	3.75 oz	145 a ³	- 3
Alion [®]	6.5 oz	80 a	43
Alion [®]	9.25 oz	45 b	68
Prowl [®] 3.3 (EC)	3.6 qt	9 c	94
Check		141 a	

¹ Treatments applied 2/20/2018.

² WAA = Weeks After Application.

³ Means within a column followed by the same lowercase letter are not significantly different at P=0.05.

Table 3. Mean percentage PRE control of itchgrass in stubble sugarcane in Raceland, LA in 2018.

Treatment ¹	Rate/a	# of itchgrass/plot	% Control
		-----3 WAA ² -----	
Lumax EZ [®] + Prowl [®] 3.3 (EC)	2 qt + 2 qt	14 b ³	87
Lumax EZ [®] + Prowl [®] 3.3 (EC)	2 qt + 3 qt	10 b	91
Lumax EZ [®] + Command [®]	2 qt + 3 pt	8 b	93
Lumax EZ [®] + Velossa	2 qt + 2 pt	47 a	59
Check		114 a	

¹ Treatments applied 2/20/2018.

² WAA = Weeks After Application.

³ Means within a column followed by the same lowercase letter are not significantly different at P=0.05.

Table 4. Mean percentage POST control of 6 to 10 inch Italian ryegrass in Cheneyville, LA in 2018.

Treatment ¹	Rate/a	% ryegrass control
		4 WAA
Axial XL [®]	16.4 oz	39 bc
Evik [®]	1 lb	3 d
Envoke [®]	0.5 oz	25 c
Asulox [®]	4 qt	54 b
Gramoxone Ineon [®]	3 pt	86 a
Check		0 b

¹ Treatments applied 3/8/2018. Induce[®] non-ionic surfactant at 0.25% v/v added to all treatments.

² WAA = Weeks After Treatment.

³ Means within a column followed by the same lowercase letter are not significantly different at P=0.05.

Table 5. Mean percentage PRE control of itchgrass in newly planted sugarcane in Raceland, LA in 2018.

Treatment ¹	Rate/a	-----# of itchgrass/plot-----			% Control 4 WAA
		2 WAA ²	3 WAA	4 WAA	
Pendimethalin (EC)	2.6 qt	11 d ³	11 e	24 de	74
	3 qt	16 cd	19 cde	26 cde	71
	3.6 qt	7 d	13 de	20 e	78
Hexazinone ⁴	1.5 pt	40 b	39 b	54 b	41
	2.2 pt	33 bc	24 bcd	45 bcd	50
	2.9 pt	38 b	31 bc	39 bcde	57
Hexazinone + HM9679A	2.2 pt + 1% v/v	44 b	34 bc	49 bc	46
Hexazinone + Triclopyr ⁵	2.2 pt + 1.4 qt	31 bc	31 bc	45 bcd	51
Check		75 a	82 a	91 a	

¹ Treatments applied 8/17/2018.

² WAA = Weeks After Application.

³ Means within a column followed by the same lowercase letter are not significantly different at P=0.05.

⁴ Hexazinone = 2.4 lb/gal.

⁵ Triclopyr = 2.87 lb ae/gal.

Table 6. Mean plantcane injury and PRE control of barnyardgrass, crabgrass, browntop millet, ivyleaf morningglory and johnsongrass 31 days after herbicide application at the Sugar Research Station in St. Gabriel, LA in 2018.

Treatment ¹	Rate/a	% Sugarcane	Barnyardgras	Crabgrass	Browntop	Ivyleaf	Johnsongrass
		Injury	s		millet	Morningglory	
		-----% control-----					
Check		0 d ²	0 d	0 c	0 c	0 c	0 c
H1168aa	10.2 oz	5 cd	98 ab	98 a	97 a	99 a	99 a
H1168aa	14.3 oz	9 abc	99 ab	99 a	98 a	100 a	99 a
H1168aa	20.4oz	8 abc	99 ab	100 a	100 a	100 a	99 a
Atrazine [®]	4 qt	0 d	10 c	10 b	10 b	85 a	10 b
Prowl H2O [®]	3.2 qt	5 cd	96 b	97 a	99 a	19 b	99 a
TriCor [®] + Command [®]	1 lb	8 abc	99 ab	99 a	99 a	88 a	100 a
Metribuzin + Velpar DF [®]	2 lb	3 cd	99 ab	99 a	99 a	99 a	98 a
H1168aa + Metribuzin [®]	10.2 oz + 2 lb	5 cd	99 ab	99 a	99 a	100 a	100 a
H1168aa + Prowl H2O [®]	10.2 oz + 3.2 qt	5 cd	99 ab	100 a	100 a	100 a	100 a
H1168aa + Velpar DF [®]	10.2 oz + 10.7 oz	7 abc	97 ab	99 a	98 a	100 a	99 a
H1168aa + Command [®]	10.2 oz + 3.3 pt	12 a	100 a	100 a	100 a	100 a	100 a
H1168aa + Metribuzin [®]	14.3 oz + 2 lb	4 cd	100 a	99 a	100 a	100 a	100 a
H1168aa + Prowl H2O [®]	14.3 oz + 3.2 qt	6 bcd	99 ab	99 a	99 a	100 a	100 a
H1168aa + Velpar DF [®]	14.3 oz +10.7 oz	7 abc	99 ab	99 a	99 a	100 a	100 a
H1168aa + Command [®]	14.3 oz + 3.3 pt	12 ab	100 a	100 a	100 a	100 a	100 a

¹ Treatments applied 8/24/2018 and 0.8 inches of rainfall was received on 8/26/2018.

² Means within a column followed by the same lowercase letter are not significantly different at P=0.05.

Table 7. Mean number of sugarcane shoots, herbicide injury, and shoot height for plantcane L01-299 treated with Flexstar® herbicide at the Sugar Research Station in St. Gabriel, LA in 2018.

Treatment ¹	Rate/a	Sugarcane	% Sugarcane	Sugarcane	% Sugarcane	Avg. Shoot Height (in)
		Shoots/plot	Injury	Shoots/plot	Injury	
		-----4 WAA ² -----		-----9 WAA-----		
Flexstar®	0.75 pt	54 a ³	2 c	132 ab	1 bc	8.2 a
	1.5 pt	55 a	3 c	137 a	3 bc	7.7 a
	3pt	46 a	9 b	123 ab	5 b	6.7 b
	6 pt	46 a	16 a	103 b	11 a	6.2 b
Check		55 a	0 c	138 a	0 c	7.8 a

¹ Sugarcane planted and treatments applied 8/21/19.

² WAA = Weeks After Application.

³ Means within a column followed by the same lowercase letter are not significantly different at P=0.05.

USING COVER CROPS TO PROMOTE SUSTAINABLE SUGARCANE PRODUCTION

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A cover crop is a crop grown for the protection and improvement of the soil. Cover crops can help prevent erosion, cycle nutrients, and improve soil organic matter after long-term use. For a perennial crop like sugarcane, cover crops can be used in the fallow year prior to replanting or in the furrows right after planting.

Effect of Cover Crop Termination Date on Plant Cane Stalk Population and Stalk Height

On September 12, 2017, L 01-299 was planted into a fallow sugarcane field at Patch Farms in Jeanerette, LA. Austrian winter pea and hairy vetch were broadcast on the row shoulders and in the wheel furrows at 9 and 1.6 lb/a, respectively on September 13, 2017 and were lightly cultivated. A study evaluated the effect of cover crop termination date on newly planted sugarcane. The herbicides TriCor[®] (2 lb/a) (metribuzin) and Brash[®] (1 qt/a) (2,4-D + dicamba) were broadcast applied using a hand spray-boom to terminate cover crop growth on January 25, 2018, February 16, 2018, and March 8, 2018. The experimental design was a randomized complete block design with 4 replications, and plot size was 18 ft X 40 ft. On January 25, 2018, cover crop biomass covered the entire research area (row top and wheel furrow) and was hand harvested from an adjacent row (3 plots, each measuring 6 ft X 50 ft). The samples were partitioned to Austrian winter pea and hairy vetch. Samples were weighed, dried for 7 days, and re-weighed to determine dry weight. Wet weight and dry weight for the Austrian winter pea averaged 3,580 and 796 lb/a, and the hairy vetch averaged 580 and 142 lb/a, respectively (Table 1). Nutrient analysis was conducted at the LSU AgCenter's Soil Testing & Plant Analysis Lab (Table 2). Stalk population and stalk height were recorded on July 2, 2018. Stalk population was significantly reduced when cover crop termination was delayed until March (Table 3). Stalk population averaged 42,580, 40,220, and 35,750 stalks/a for the January, February, and March termination treatments, respectively. Stalk height was also reduced when termination was delayed until February. Stalk height averaged 51.8, 49.5, and 48.0 inches for the January, February, and March termination treatments, respectively.

Effect of Drilled Cover Crops on Sugarcane Yield

On August 20, 2017, HoCP 96-540 was planted into a fallow sugarcane field at Blanchard Brother Inc. in Glencoe, LA. A cover crop study was initiated on October 13, 2017 and treatments included a mixture of Sunn hemp, Bullseye Radish[™], and Rapeseed and a non-planted check. Sunn hemp, Bullseye radish, and Rapeseed were drill seeded on the sugarcane row shoulders at 28, 9, and 9 lb/a, respectively. Normal sugarcane production practices were conducted to the entire study area. The experimental design was a randomized complete block design with 4 replications, and plot size was 12 ft X 50 ft. Radish and rapeseed plants were harvested on January 25, 2018, and nutrient analysis was conducted at the LSU AgCenter's Soil

Testing & Plant Analysis Lab (Table 4). Sugarcane yield (tons/a) significantly increased with the cover crop treatment compared with the non-planted check, resulting in 7.1 tons/a increase of sugarcane per acre (Table 5). Sugar yield (lbs. sugar/a) significantly increased with the cover crop treatment compared with the non-planted check, resulting in an additional 1,437 lbs. sugar/a.

Our preliminary results indicated that if carefully managed, cover crops have a beneficial effect within a sugarcane cropping system in Louisiana.

Table 1. Cover crop biomass harvested at Patch Farms in Jeanerette, LA in 2018.

Cover Crop ¹	Wet Weight (lb/a)	Dry Weight (tons/a)	Moisture (%)
Austrian Winter Pea	3,580	796	77.8
Hairy Vetch	580	142	75.5

¹ Cover crop planted on 9/13/17 and harvested 1/25/18.

Table 2. Nutrient analysis of cover crops from harvested at Patch Farms in Jeanerette, LA in 2018.

Cover Crop ¹	Nitrogen (%)	Phosphorous (%)	Potassium (%)	Sulfur (%)	Zinc (ppm)	Calcium (%)
Austrian Winter Pea	2.97	0.28	1.93	0.25	35	1.27
Hairy Vetch	4.11	0.42	2.92	0.29	81	1.36

¹ Cover crop planted on 9/13/17 and harvested 1/25/18.

Table 3. Stalk population and stalk height for three cover crop¹ termination dates at Patch Farms in Jeanerette, LA in 2018.

Cover Crop Termination ² (Date)	Stalk Population (number/a)	Stalk Height (in)
January 25, 2018	42,580 a ²	51.8 a
February 16, 2018	40,220 a	49.5 b
March 8, 2018	35,720 b	48.0 b
Adjacent Cane w/No Cover Crop ⁴	38,078	47.6

¹ Austrian winter pea (9 lb/a) and hairy vetch (1.6 lb/a) planted onto row hips and in wheel furrow of plantcane L 01-299 on 9/13/17.

² TriCor[®] (2 lb/a) (metribuzin) and Brash[®] (1 qt/a) (2,4-D + dicamba) were broadcast applied to terminate cover crop growth.

³ Means within a column followed by the same lowercase letter are not significantly different at P=0.05.

⁴ Measurements recorded in same sugarcane block and was immediately adjacent to the study.

Table 4. Nutrient analysis of cover crops from harvested at Blanchard Brothers Inc. in Glencoe, LA in 2018.

Cover Crop ¹	Nitrogen (%)	Phosphorous (%)	Potassium (%)	Sulfur (%)	Zinc (ppm)	Calcium (%)
Bullseye Radish™ (tuber)	3.29	0.47	4.24	1.29	35	1.35
Bullseye Radish™ (follage)	3.00	0.55	3.45	1.08	32	3.25
Rapeseed (follage)	3.23	0.39	3.24	0.79	23	2.28

¹ Cover crop planted on 10/13/17 and harvested 1/25/18.

Table 5. Effect of a mixture of drill seeded cover crops on plant cane HoCP 96-540 yield¹ at Blanchard Brothers Inc. in Glencoe, LA in 2018.

Treatment	Stalk Population (number/a)	Stalk Height (in)	Sugarcane Yield (tons/a)	TRS (lb/ton)	Sugar Yield (lb/a)
Cover Crop ²	45,339a	60.8a	55.9 a ³	232a	12,985 a
No Cover Crop	45,012a	62.7a	48.8 b	236a	11,548 b

¹ Population and height measured on 7/2/2018 and the study was harvested on 12/12/18.

² A mixture of Sunn hemp, Bullseye radish™, and Rapeseed were drill seeded on the sugarcane row shoulders at 28, 9, and 9 lb/a, respectively, on 10/13/17.

³ Means within a column followed by the same lowercase letter are not significantly different at P=0.05.

SOYBEAN PRODUCTION RESEARCH IN FALLOW SUGARCANE PRODUCTION SYSTEMS

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Soybean Variety Performance

Two 2018 studies evaluated soybean variety performance in fallow sugarcane systems. The experimental design for each study was a randomized complete block design with 4 replications, and the plot size was 18 ft X 30 ft. Ten soybean varieties were planted on raised fallow sugarcane beds at the Sugar Research Station in St. Gabriel, LA on April 3, 2018, and Iberia Research Station in Jeanerette, LA on April 12, 2018. The seeding rate was 120,000 seed/a. Soybean seed were planted in two drills on the top of sugarcane beds and were spaced 18 inches apart. The soil type is classified as a Commerce silt loam and Baldwin silty clay for the sites at the Sugar Research Station and Iberia Research Station, respectively. Plots were harvested on August 22, 2018 and August 24, 2018 at the Iberia Research Station and Sugar Research Station, respectively. The center row of each plot was harvested using a plot combine, and samples were bagged and weighed. Samples were then analyzed for moisture content, and soybean yield was adjusted to 13% moisture content. Soybean variety yields are reported in Table 1.

Table 1. 2018 soybean variety yields in fallow sugarcane systems at the Sugar Research Station in St. Gabriel, LA and Iberia Research Station in Jeanerette, LA.

Variety:	-----Soybean Yield ¹ (bushels/a)-----		
	Sugar Research Station ²	Iberia Research Station ³	Average
Asgrow AG 40X6	40.4 c ⁴	42.8 b	41.6
Terral 41A48	57.8 ab	53.0 a	55.4
NK S41-A1X	55.4 ab	51.1 a	53.3
NK S42-P6	52.9 b	55.1 a	54.0
Progeny P4255RX	53.4 b	51.4 a	52.4
Terral E422X38998	60.7 ab	56.5 a	58.6
Asgrow AG 43X7	49.4 b	57.6 a	53.5
NK S43-V3X	59.0 ab	55.4 a	57.2
Asgrow AG 44X6	51.7 b	56.5 a	54.1
Terral 45A46	65.7 a	56.0 a	60.9
CV	9.65	5.7	

¹ Moisture adjusted to 13%

² Planted April 3, 2018 and harvested August 24, 2018. Soil type = Commerce silt loam.

³ Planted April 12, 2018 and harvested August 22, 2018. Soil type = Baldwin silty clay

⁴ Means within a column followed by the same lowercase letter are not significantly different at P=0.05.