BILLET PLANTING RESEARCH

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Research continued to develop methods to maximize the chances of success with billet (stalk section) planting. During 2016, results were obtained from field experiments conducted at the Sugar Research Station at St. Gabriel evaluating the potential for seed-treatment chemicals to improve stand establishment and yield in billet plantings. Planting method tests comparing two billet planters and whole stalk hand planting were conducted at the Sugar Research Station. Finally, on-farm evaluations were conducted to assess physical damage to billets caused by different planters, and stalk populations were compared in whole stalk and billet plantings.

Seed Treatment Chemicals

Chemical seed (billet) treatments continued to be evaluated in field experiments to determine whether they can increase yields obtained from billet plantings in Louisiana. Results were obtained from on-going and newly established experiments comparing different varieties, treatments, and application methods.

Second ratoon results were obtained in a field experiment with variety HoCP 96-540 evaluating application of seed treatment chemicals applied as a dip treatment or an in-furrow spray application singly or in various combinations. The treatments were: non-treated 3-4 bud billets, non-treated whole stalks, Uniform fungicide (28.2% azoxystrobin and 10.9% mefenoxam) 1% dip, Uniform in-furrow spray at 20 oz/acre, Dynasty fungicide (6.6% azoxystrobin, 1.1% fludioxonil, and 3.3% mefenoxam) 1% dip, Dynasty in-furrow spray at 20 oz/acre, Cruiser insecticide (47.6% thiamethoxam) in-furrow spray at 20 oz/acre, Uniform + Cruiser dip, and Uniform + Cruiser in-furrow spray. Dip application provides complete coverage of the treated billets, but it may be difficult to achieve commercially. Therefore, an in-furrow spray chemical application method was compared in this experiment. Treatments were applied with a CO_2 backpack sprayer in a 36 inch band over the top of billets in the planting furrow before covering using a broadcast volume of 15 gallons per acre.

Cane tonnage and total sugar yields were generally similar for whole stalks and the dip chemical treatments in plant cane and first ratoon, whereas yields for in-furrow spray treatments were lower and similar to non-treated billets (Table 1). However, the higher yields detected for billet plantings receiving dip applications were no longer significant in second ratoon (Table 1). Environmental stress due to drought stress and/or winter freezes after planting can result in lower yields in non-treated billets compared to whole stalks. Severe freezes resulted in lower plant cane and first ratoon yields for non-treated billets in this experiment, but these reductions were not evident when the billets received a dip application of the fungicides, insecticide or combinations of fungicide and insecticide prior to planting.

Table 1. Cane tonnage and total sugar yields for HoCP 96-540 billets planted with and without treatment with different combinations of seed-treatment chemicals and non-treated whole stalks in 2014 plant cane, 2015 first ratoon, and 2016 second ratoon in a field experiment at the Sugar Research Station.

	Plant cane		First ratoon		Second ratoon	
Treatment	Tons cane/A[1]	Sugar/A (lbs.)[1]	Tons cane/A[1]	Sugar/A (lbs.)[1]	Tons cane/A[1]	Sugar/A (lbs.)[1]
Non-treated billets	39.3 ef	6,099 cd	46.0 cd	9,445 cde	39.9	9,253
Non-treated whole stalks	47.2 bc	7,475 ab	55.1 a	11,492 a	43.4	9,914
Billets Uniform dip treatment	46.7 bcd	7,211 ab	51.5 abc	10,704 abc	37.4	8,687
Billets Uniform in-furrow spray	36.6 f	5,477 d	45.5 cd	9,174 cde	38.5	8,671
Billets Dynasty dip treatment	44.3 cde	6,715 bc	51.2 abc	10,255 abcd	42.8	9,829
Billets Dynasty in-furrow spray	41.1 def	5,930 cd	43.7 d	8,784 de	40.0	9,091
Billets Cruiser dip treatment	52.3 ab	7,972 a	49.5 abcd	9,790 bcde	43.1	9,417
Billets Cruiser in-furrow spray	43.4 cde	6,567 bc	47.8 bcd	9,766 bcde	40.7	9,091
Billets Uniform + Cruiser dip treatment	53.6 a	8,065 a	54.4 ab	11,112 ab	36.1	8,052
Billets Uniform + Cruiser in-furrow spray	36.1 f	5,370 d	43.2 d	8,665 e	37.1	8,383

[1]Mean values within a column followed by the same letter were not significantly different (*P*=0.05). A = acre. No letters are shown when all means were similar.

First ratoon yields were determined and compared in a field experiment comparing HoCP 96-540 non-treated billets and whole stalks to billets dip treated with different seed treatment chemicals singly or in combinations. The experiment compared non-treated billets and whole stalks to billets receiving a dip application of Cruiser insecticide (thiamethoxam), Dynasty fungicide (axozystrobin, fludioxanil, and mefanoxam), Uniform fungicide (azoxystrobin and mefanoxam), QuadrisXtra fungicide (azoxystrobin and cyproconazole), Cruiser + Dynasty, Cruiser + Uniform, Cruiser + QuadrisXtra, and the disinfectant Pinesol. The concentrations of the insecticide and fungicides in the dip solutions were reduced to approximate commercial label rates, and the fungicides were adjusted to have similar concentrations of active ingredients for one fungicide, azoxystrobin. The rates for each chemical were 11.5 oz/acre formulated product of Cruiser (0.3% in the dip solution), 27.7 oz/acre of Dynasty (0.72% dip), 6.5 oz/acre of Uniform (0.17% dip), and 10.4 oz/acre of QuadrisXtra (0.27% dip). Pinesol was diluted at the recommended rate of ¼ cup (60 ml) per gallon of water (1.6% solution). The experiment was conducted in cooperation with Dr. Paul White of the USDA-ARS Sugarcane Research Unit.

Differences were detected among treatments for cane tonnage and total sugar yield in plant cane (Table 2). All chemical treatments had comparable cane tonnage to whole stalks, and all had higher tonnage than non-treated billets, except for the fungicides Dynasty and Uniform applied alone. All chemical treatments had comparable total sugar yield to whole stalks and a higher yield than non-treated billets, except Dynasty alone and Cruiser + QuadrisXtra. Pinesol total sugar yield was lower than for all treatments, except for non-treated billets. However, only two of the insecticide/fungicide combination treatments, Cruiser + Uniform and Cruiser + Quadris Xtra, still had higher cane tonnage and sugar yields in first ratoon (Table 2).

Table 2. Comparison of 2015 plant cane and 2016 first ratoon cane tonnage and total sugar yields for HoCP 96-540 billets planted with and without treatment with different combinations of seed-treatment chemicals and non-treated whole stalks in a field experiment at the Sugar Research Station.

Variety and treatment	Tons cane/acre[1] Plant cane	Sugar/acre (lbs.)[1] Plant cane	Tons cane/acre[1] First ratoon	Sugar/acre (lbs.)[1] First ratoon
Non-treated billets	34.5 de	7,638 d	28.2 cd	5,534 bc
Non-treated whole stalks	47.8 abc	10,640 ab	29.0 bc	5,742 ab
Cruiser dip	42.5 bc	9,192 bcd	28.8 bc	5,657 ab
Dynasty dip	40.2 cd	8,434 cd	27.0 cd	5,146 bc
Uniform dip	42.0 bcd	9,526 bc	26.2 cd	5,035 bc
QuadrisXtra dip	51.0 a	11,560 a	27.5 cd	5,531 bc
Cruiser + Dynasty	47.5 abc	10,507 ab	28.8 bc	5,721 ab
Cruiser + Uniform	49.5 ab	11,169 a	34.8 ab	6,988 a
Cruiser + QuadrisXtra	53.0 a	11,886 a	35.8 a	7,021 a
Pinesol	28.2 e	5,856 e	22.5 d	4,266 c

[1]Mean values within a column followed by the same letter were not significantly different (P=0.05).

A field experiment was planted September 17, 2015 comparing HoCP 96-540 non-treated billets and whole stalks to billets dip treated with seed treatment chemicals singly or in combinations. The treatments were non-treated billets, non-treated whole stalks, Platinum 75 SG insecticide (thiamethoxam 75%) at 5.67 oz (weight)/acre, Uniform fungicide (azoxystrobin 28.2% and mefenoxam 10.9%) at 6.5 oz/acre, Quilt Xcel fungicide (azoxystrobin 13.5% and propiconazole 11.7%) at 20 oz/acre, Quadris fungicide (azoxystrobin 22.9%) at 11.5 oz/acre, Platinum + Uniform, Platinum + Quilt Xcel, Platinum + Quadris, Xanthion fungicide at 1.2 oz/acre (component A) and 6 oz/acre (component B), and the disinfectant Pinesol at 60 ml/gal (1.6%). Stand establishment and plant cane yield components were determined and compared.

Differences were detected among treatments for initial fall shoot populations, spring shoot populations, and millable stalk populations (Table 3). Initial shoot populations during the fall were highest for the whole stalk planting; no seed treatment chemical treatment increased initial shoot population compared to non-treated billets. Following a very dry fall and a mild winter, the Platinum + Quilt Xcel and Platinum + Quadris treatments had spring shoot populations equivalent to the whole stalk planting, and all chemical treatments with the exception of Pinesol had higher populations than non-treated billets. The Platinum + Quilt Xcel and Platinum + Quadris treatments also had millable stalk populations equivalent to the whole stalk planting and higher than the non-treated billets.

Differences were detected in plant cane among treatments for cane tonnage and total sugar yields, whereas no differences were detected among treatments for stalk weight and sugar per ton of cane (Table 4). Five treatments, including Platinum (insecticide), Xanthion and the three insecticide/fungicide treatments, Platinum + Uniform, Platinum + Quilt Xcel, and Platinum + Quadris, had equivalent cane tonnage yields to the whole stalk planting. All of those treatments with the exception of Xanthion had higher tonnage and total sugar yield than non-treated billets.

Table 3. Comparison of plant cane fall (primary) shoot, spring shoot, and millable stalk populations for HoCP 96-540 billets with and without dip treatment with different combinations of seed-treatment chemicals and whole stalks in a field experiment conducted at the Sugar Research Station during 2016.

Treatment	Fall shoots/acre[1]	Spring shoot population/acre[1]	Millable stalks per acre[1]
Non-treated billets	10,562 c	26,874 g	25,306 d
Non-treated whole stalks	29,669 a	59,868 a	41,660 a
Platinum dip	14,396 bc	46,602 bcd	34,019 abcd
Uniform dip	12,827 c	38,969 def	27,885 cd
Quilt Xcel dip	13,141 bc	41,966 cde	32,033 bcd
Quadris dip	17,567 b	47,648 bc	29,558 bcd
Platinum + Uniform	12,478 c	38,202 ef	33,253 abcd
Platinum + Quilt Xcel	14,152 bc	53,678 ab	37,470 ab
Platinum + Quadris	13,803 bc	52,179 ab	35,205 abc
Xanthion	12,444 c	37,923 ef	34,019 abcd
Pinesol	11,537 c	31,789 fg	29,175 bcd

[1]Mean values within a column followed by the same letter were not significantly different (*P*=0.05).

Table 4. Comparison of plant cane yield components for HoCP 96-540 billets with and without dip treatment with different combinations of seed-treatment chemicals and whole stalks in a field experiment at the Sugar Research Station during 2016.

Treatment	Stalk weight (lbs.)[1]	Sugar/ton cane (lbs.)[1]	Tons cane/acre[1]	Sugar/acre (lbs.)[1]
Non-treated billets	2.5	217 ab	30.7 d	6,640 c
Non-treated whole stalks	2.3	223 a	47.0 a	10,497 a
Platinum dip	2.4	221 ab	43.6 abc	9,603 ab
Uniform dip	2.5	221 ab	32.1 d	7,063 c
Quilt Xcel dip	2.3	223 a	35.4 bcd	7,898 bc
Quadris dip	2.5	218 ab	34.7 cd	7,580 bc
Platinum + Uniform	2.5	217 ab	43.1 abc	9,370 ab
Platinum + Quilt Xcel	2.6	212 b	45.1 ab	9,583 ab
Platinum + Quadris	2.4	222 ab	43.7 abc	9,666 ab
Xanthion	2.4	215 ab	36.9 abcd	7,960 bc
Pinesol	2.6	217 ab	43.6 abc	7,040 c

[1]Mean values within a column followed by the same letter were not significantly different (*P*=0.05). No letters are shown when all means were similar.

The seed treatment chemicals continue to show the potential to increase stands and stalk populations in billet plantings that result in increased cane tonnage and total sugar yield. The results suggest that the most consistent benefit comes from dip application of combinations of insecticide and fungicides. The results with the seed-treatment chemicals are promising, and the research will be continued.

Planting Method Experiments

A second field experiment was planted to compare two billet planting methods and whole stalk planting. Two varieties, HoCP 96-540 and HoCP 04-838, were included with two planting dates. Billets were planted with a conventional drum planter in which billets are metered under the drum into a single open furrow or with a double-drill planter in which billets are carried over the top and through two funnels into each of two narrow drills opened in the 70 inch row. Whole stalks were hand-planted at a rate of three stalks and a lap. The planting rates for the billets were determined as number of billets in the open furrow or for both drills combined. The two planting dates were September 1 and 23, 2015. The experiment was conducted in cooperation with Dr. Paul White of the USDA-ARS Sugarcane Research Unit.

At the first planting date, the planting rate assessed as number of billets in the furrow and cane tonnage was higher for double-drilled billets of HoCP 96-540 and higher for HoCP 04-838 billets planted with both methods (Table 5). At the second planting date, the billet planting rates were higher than for whole stalks. The amount of physical damage caused by the harvester and two planters was determined and compared for the first planting (Table 6). Damage to billets caused by the mechanical planters was indicated by some reductions in average length and number of buds per billet and percentages of undamaged billets then some increases in number of damaged buds and internodes per billet. Physical damage was less evident for the double-drill planter compared to the conventional under-the-drum planter.

Differences in plant cane yield components were detected among the planting methods and varieties in both plantings. However, the outcomes of the two plantings were extremely different with the second planting being adversely affected by an extended drought period before and after planting followed by extended wet soil conditions. In the first planting, no differences were found for stalk weight (both varieties) and sugar per ton of cane (for HoCP 04-838) (Table 7). The cane tonnage and total sugar yields were higher for the whole stalk planting than both billet plantings for HoCP 96-540, but the double-drilled billet yields were higher than open-furrow billets and equivalent to the whole stalk yields for HoCP 04-838 (Table 7). In the second planting, adverse weather conditions resulted in problems with stand establishment, particularly for the billet plantings of HoCP 96-540. Double-drilled billets had higher cane tonnage and total sugar yields than open-furrow planted billets but lower yields than for whole stalks (Table 8). HoCP 04-838 billet plantings were less affected by the adverse weather conditions, and the double-drilled billet cane tonnage yield was higher than for non-treated billets and equivalent to whole stalks. However, total sugar yields were lower for both billet plantings compared to whole stalks. The results suggest that double-drill planting may provide an advantage over open-furrow billet planting, particularly under dry conditions due to a greater maintenance of moisture in the row. The results with double-drill billet planting are promising and will be continued.

Table 5. Planting method comparison results for planting rates as determined by number of billets in the row furrow or cane weight for HoCP 96-540 and HoCP 04-838 planted at two dates as billets with a conventional drum planter in an open furrow, billets planted in a double-drill, and hand-planted whole stalks in a field experiment conducted at the Sugar Research Station during 2016.

		September 1st planting date[2]		September 23rd planting date[2]	
Variety	Method[1]	Planting rate	Cane weight	Planting rate	Cane weight
HoCP 96-540	Open furrow	3.5 b	5.0 b	4.7 a	7.1 a
HoCP 96-540	Double-drill	5.1 a	7.8 a	4.8 a	7.6 a
HoCP 96-540	Whole stalk	3.0 b	4.7 b	3.0 b	3.6 b
HoCP 04-838	Open furrow	5.0 a	5.6 a	5.3 a	5.2 b
HoCP 04-838	Double-drill	5.4 a	6.8 a	5.5 a	7.3 a
HoCP 04-838	Whole stalk	3.0 b	3.8 b	3.0 b	2.6 b

[1]Billets were machine-planted in an open furrow or in a double-drill, and whole stalks were hand-planted in an open furrow. Mean values within a variety and column followed by the same letter were not significantly different (*P*=0.05).
[2]Planting rate was estimated as the number of seedcane billets or stalks per foot of row or by the tons of cane planted per acre. Mean values within a variety and column followed by the same letter were not significantly different (*P*=0.05).

Table 6. Planting method comparison results for billet characteristics determined for HoCP 96-540 and HoCP 04-838 after cutting with a mechanical harvester and then after passing through the conventional drum planter or the double-drill planter for the September 1, 2015 planting date in a field experiment conducted at the Sugar Research Station during 2016.

		Billet characteristics[1]				
Time of evaluation	Variety	Length (inches)	Number of buds/billet	Number of damaged buds	Number of damaged internodes	Billets with no damage
After harvester	HoCP96-540	24.5	3.5 ab	0.1 b	0.5 b	60%
After drum planter	HoCP96-540	23.5	3.7 a	0.3 a	1.1 a	40%
After double-drill planter	HoCP96-540	23.3	3.3 b	0.3 a	0.6 b	28%
After harvester	HoCP04-838	23.2 a	4.5 a	0.5	0.8	31%
After drum planter	HoCP04-838	21.6 b	3.4 b	0.4	0.9	27%
After double-drill planter	HoCP04-838	23.2 a	3.6 b	0.6	0.9	30%

[1]Mean values within a variety and column followed by the same letter were not significantly different (*P*=0.05). No letters are shown when all means were similar.

Table 7. Planting method comparison results for plant cane yield components of HoCP 96-540 and HoCP 04-838 planted as billets with a conventional drum planter in an open furrow, billets planted in a double-drill, and hand-planted whole stalks in a field experiment conducted at the Sugar Research Station during 2016 (first planting – September 1, 2015).

Variety and treatment	Stalk weight (lbs.)[1]	Sugar/ton cane (lbs.)[1]	Tons cane/acre[1]	Sugar/acre (lbs.)[1]
HoCP 96-540				
Double-drill billets	2.0	179 ab	38.8 b	6,950 b
Drum planter/open-furrow billets	2.0	183 a	36.8 b	6,753 b
Whole stalk hand-plant	2.0	175 b	42.0 a	7,366 a
HoCP 04-838				
Double-drill billets	1.5	189	36.3 a	6,896 a
Drum planter/open-furrow billets	1.5	182	33.4 b	6,096 b
Whole stalk hand-plant	1.6	186	36.1 a	6,711 a

[1]Mean values within a variety and column followed by the same letter were not significantly different (*P*=0.05). No letters are shown when all means were similar.

Table 8. Planting method comparison results for plant cane yield components of HoCP 96-540 and HoCP 04-838 planted as billets with a conventional drum planter in an open furrow, billets planted in a double-drill, and hand-planted whole stalks in a field experiment conducted at the Sugar Research Station during 2016 (second planting – September 23, 2015).

Variety and treatment	Stalk weight (lbs.)[1]	Sugar/ton cane (lbs.)[1]	Tons cane/acre[1]	Sugar/acre (lbs.)[1]
HoCP 96-540				
Double-drill billets	2.0	223 a	20.7 b	4,583 b
Drum planter/open-furrow billets	2.0	208 ab	8.4 c	1,742 c
Whole stalk hand-plant	2.2	201 b	39.4 a	7,934 a
HoCP 04-838				
Double-drill billets	1.7 b	194	36.3 a	6,994 a
Drum planter/open-furrow billets	1.8 ab	194	26.5 b	5,119 b
Whole stalk hand-plant	2.0 a	204	40.3 a	8,263 a

[1]Mean values within a variety and column followed by the same letter were not significantly different (*P*=0.05). No letters are shown when all means were similar.

On-Farm Evaluations of Planters and Stalk Populations

Physical damage to billets causes loss of buds and rind damage that provides starting points for stalk rot. Harvester modifications have been developed that can minimize physical damage to billets. However, mechanical planting then causes additional damage. During the 2016 planting season, billet damage caused by four types of planters was evaluated. Billet characteristics and mechanical damage were determined after harvesting (before the planter) and after passing through the planters (Table 9). A Custom Fab single-row billet planter with active floor and over-the-top elevator delivery of billets into two front-mounted funnels (but planting into an open furrow) was compared to a conventional slat drum planter with underneath front delivery at one location. The Deere harvester out-fitted with the seed billet modification package cut long billets (30.8 inch average length) with little damage. Both planters caused some additional damage to billets, but the Custom Fab planter caused greater damage as indicated by increased numbers of damaged buds and internodes and the lower percentage of undamaged billets. A Louviere single-row billet planter with active floor and over-the-top drum delivery into two front-mounted funnels (but planting into an open furrow) was evaluated at another location. This Louviere planter caused minimal additional damage to the billets. At a third location, a new single-row Traube planter with tip delivery and over-the-top elevator front delivery was compared using billets cut with two harvesters with different modifications for cutting billets and also compared to a 3-row Traube planter. The quality of the billets was similar coming out of the harvesters with either rubber inserts or the seed shaft. The amount of additional damage caused by the planters receiving billets cut by each harvester was minor, and the damage caused by the single and three-row harvesters was similar.

Many new billet planter designs are being introduced and tried in Louisiana. The new planters all carry billets over the top of an elevator or drum rather than billets passing under a drum. It is difficult to compare harvesters and planters on different farms under variable conditions. Many factors can affect billet characteristics aside from the planter design, including variety, time of day (moisture on cane), degree of lodging, and equipment settings. The new planters generally have done a good job metering to provide a relatively consistent planting rate, and the numbers collected have indicated they often are causing only a minor amount of additional damage. The greater amount of damage observed in billets cut with this Custom Fab planter model may have been associated with the long billet length achieved by the harvester and a steep elevator angle in the planter resulting in bending of the billets sufficient to cause a break in the stalk rind. The optimal front end design for a billet planter is still uncertain at this point.

Conversion from 6-foot-center to 8-foot-center rows on at the Rivet farm has offered the opportunity to monitor and compare stand establishment and stalk populations produced from double-drill billet and whole stalk plantings of multiple varieties. Millable stalk populations were similar in billet and whole stalk plantings, except in two fields, during 2015. Stalk populations were estimated for five of the fields in first ratoon during 2016, including the two with higher populations in whole stalk planted rows during 2015 (Table 10). Billet planting stalk populations in those two fields (Holiday 8 and Holiday 16) were numerically lower in first ratoon, but the differences were not significant, indicating a narrowing of the differences between the two planting types. In one field (Belmont 8), the first ratoon stalk population was higher in the billet planting, while the whole stalk population was higher in another field (Surprise 14).

Millable stalk populations were estimated and compared in billet and whole stalk plantings in three additional fields during plant cane in 2016 (Table 11). The stalk population was higher for the whole stalk planted rows compared to billet planted in one field (Homeplace), but the billet planted rows had a higher stalk population in another field (Trinity), while the populations were equivalent in the third field. Challenging environmental conditions occurred following planting, so the similar yields obtained in billet and whole stalk plantings were encouraging.

With multiple factors imperiling conventional whole stalk hand and machine planting, research to develop methods to make billet planting more reliable will continue to be a high priority. The ability to plant high quality billets with minimal damage is needed. New billet planters are generally causing less damage and providing more consistent planting rates than conventional drum planters. Chemical protection against stalk rot damage would be desirable, and chemicals are available that show the potential to improve stand establishment under adverse conditions and prevent reduced yields. Subsequent research will focus on additional chemicals, lower rates of application, and an effective chemical delivery system. The double-drill planting method shows promise but needs additional evaluation to determine whether it can increase billet planting yield with conventional row spacing using the same amount of seedcane and without any additional inputs.

Table 9. Comparison of billet characteristics and mechanical damage caused by the harvester and four different planters during 2016.

		Billet characteristics[2]				
Planter[1]	Time of evaluation[1]	Length (inches)	Number of buds/billet	Number of damaged buds	Number of damaged internodes	Billets with no damage
Custom Fab	After harvester	30.8 a	4.4	0.3 b	0.7 b	56%
	After planter	27.9 b	4.2	0.9 a	1.6 a	16%
Slat planter	After slat planter	28.0 b	4.1	0.5 b	1.1 b	26%
Louviere	After harvester	23.9	4.2 a	0.4 b	0.4	44%
	After planter	22.8	3.9 ab	0.5 ab	0.7	35%
	After planter (2)	22.6	3.6 b	0.7 a	0.7	38%
Traube	After harvester -	22.2 a	3.3 ab	0.3 ab	0.8 ab	34%
	After harvester +	22.2 a	3.5 a	0.3 a	0.9 a	32%
1-row planter	After 1-row planter (-)	18.7 b	2.8 c	0.3 a	0.7 abc	32%
	After 1-row planter (+)	20.2 b	3.0 bc	0.3 a	0.6 bc	54%
3-row planter	After 3-row planter	19.5 b	2.9 c	0.2 b	0.5 c	-

[1]Custom Fab planter with front elevator, over-the-top delivery, Deere harvester with seedcane package; Louviere with front drum, over-the-top delivery; Deere harvester without seedcane package; Traube single-row planter with bed tip front delivery, billets cut with Deere harvester with rubber inserts but no seed shaft (-) Deere harvester with seed shaft (+), and Traube three-row planter with bed tip front delivery. Varieties planted were HoCP 96-540 for the Custom Fab planter, L 01-299 for the Louviere planter, and HoCP 00-950 for the Traube planters.
[2]Mean values within a planter and column followed by the same letter were not significantly different (*P*=0.05). No letters are shown when all means were similar.

Table 10. Comparison of millable stalk populations in plantings of whole stalks and billets for plant cane during 2015 and first ratoon during 2016 on the Rivet farm.

			Millable stalk population per acre[1]	
Field	Variety	Planting method	Plant cane	First ratoon
Belmont 8	HoCP 96-540	Whole stalk	50,142 a	50,273 b
		Billet	51,714 a	54,455 a
Holiday 8	L 01-299	Whole stalk	47,714 a	58,273 a
		Billet	42,071 b	53,273 a
Holiday 15	HoCP 04-838	Whole stalk	57.928 a	57,727 a
		Billet	58,857 a	59,091 a
Holiday 16	HoCP 04-838	Whole stalk	58,071 a	55,727 a
		Billet	51,857 b	53,273 a
Surprise 14	HoCP 00-950	Whole stalk	53,071 a	48,455 a
		Billet	50,357 a	41,891 b

[1]Mean values within a variety and column followed by the same letter were not significantly different (*P*=0.05).

Table 11. Comparison of millable stalk populations in plantings of whole stalks and billets for plant cane during 2016 on the Rivet farm.

Field location	Variety	Planting method	Millable stalk population per acre[1]
Homeplace	L 01-283	Whole stalk	58,636 a
		Billet	55,455 b
Raymer	HoCP 96-540	Whole stalk	42,455 b
		Billet	47,273 a
Trinity	L 01-299	Whole stalk	47,091 b
		Billet 1	59,182 a
		Billet 2	55,819 a

[1]Mean values within a variety followed by the same letter were not significantly different (*P*=0.05).