Durum Seeding Methods, 1988

M. J. Ottman, J. Harper, and B. Tickes

ABSTRACT

WestBred 881 durum commands a premium price due to its superior quality, but it produces a lower yield than other commercially available cultivars. Studies conducted at Maricopa in 1987 suggested that yields of WestBred 881 may be increased by 3-inch row spacing. Studies were conducted at three commercial farms in an effort to mimic the effect obtained with 3-inch row spacing by using conventional grain drills to obtain more uniform plant spacing. Seeding twice in parallel directions did not result in the desired effect because the seed planted in the first pass was covered by extra soil from the second pass, and the seedlings emerged from cracks made by the disk openers from the second pass. Broadcasting on beds resulted in a poor stand and non- uniform plant distribution compared to drilling the beds. Planting twice in perpendicular directions to each other resulted in a more uniform plant distribution than drilling once, but a slightly poorer stand was achieved due to extra wheel traffic and yields were not significantly increased. The best method to obtain a more uniform plant spacing may be to seed with a 3-inch drill.

INTRODUCTION

WestBred 881 durum commands a premium price due to its superior quality, but produces a lower yield than other commonly grown cultivars. Optimum cultural practices for WestBred 881 have not been identified. However, studies conducted at Maricopa in 1987 have suggested that WestBred 881 may respond to 3-inch row spacings. Grain drills which plant in 3-inch rows are not commercially available. The purpose of these studies was to determine the influence of alternative seeding methods on yield an yield components of WestBred 881 and Aldura durum.

MATERIALS AND METHODS

Trials were initiated on three commercial farms during the 1987- 88 growing season investigating various seeding methods. At the Greg Wuertz farm in Casa Grande, WestBred 881 and Aldura were drilled once in 7-inch rows or drilled twice in parallel directions on flat ground using 200 lbs seed/A on December 11, 1987. The experimental design was a split plot with cultivars as main plots and four replications. The field was "irrigated up" on December 14th. Grain was harvested from 17.3 ft x 300 ft plots on May 31, 1988.

At the Arny Schlittenhart farm in Eloy, WestBred 881 and Aldura were drilled once in 6-inch rows or broadcast (followed by a cultipacker) on beds using 175 lbs seed/A on January 5, 1988. The experiment was designed as a randomized complete block with four replications. The field was irrigated during the week of January 11-15. Grain was harvested from 20 ft x 963 ft plots on June 10.

WestBred 881 was drilled once in 7-inch rows or drilled twice in perpendicular directions at 120 lbs seed/A into moisture (dry mulch) at the John Klingenberg farm in Roll on January 8, 1988. The experiment was designed as a randomized complete block with 4 replications. Grain was harvested from two subplots measuring 275 or 290 ft x 20 ft on June 1.

The grain drills were set to plant half the normal seeding rate when planting twice to produce a total seeding rate equal to the normal rate. Stand counts were recorded at the one to two-leaf stage; the weight per kernel, kernels per head, heads per unit area, plant height, and lodging were determined at harvest.

RESULTS AND DISCUSSION

The influence of seeding method on yield, yield components, and plant characteristics of WestBred 881 and Aldura at the Greg Wuertz farm is presented in Table 1. Most of the differences detected were due to cultivar. WestBred 881 had lower grain yield, higher kernel weight, fewer kernels per head, lower head number, and greater plant height than Aldura. The only difference detected due to seeding method was in plant stand, which was less when drilled twice.

Drilling twice in the same direction did not result in a row spacing between 0 and 7 inches as intended. The seed planted in the first pass was covered by extra soil from the second pass and the seedlings emerged from cracks made by the disk openers from the second pass. Differences in row spacing or placement between the two seeding methods were not visually discernible. Therefore, the lack of differences between seeding methods in terms of yield and yield components is not surprising.

The results of the trial at the Arny Schlittenhart farm is presented in Table 2. No differences in grain yield or head number were detected. WestBred 881 had a higher kernel weight, smaller head size, and taller plant height than Aldura. Broadcast seeding resulted in lower kernel weight and a poorer stand.

Broadcast seeding on beds also resulted in less uniform plant distribution than drilling. The majority of the seed germinated in the furrows in this test. Any potential differences due to seeding methods were probably masked in this study by the low yields. The yields were restricted in this study due to a later than optimum planting date and due to moisture stress during a pump breakdown.

The influence of seeding method on yield, yield components, and plant characteristics of WestBred 881 at the John Klingenberg farm is presented in Table 3. No difference due to seeding method was detected except for a better stand achieved by drilling once instead of twice. Drilling twice resulted in extra wheel traffic which hindered emergence.

A more uniform plant distribution similar to 3-inch row spacing was not achieved by dilling twic in parallel directions or broadcasting on beds. Drilling twice in perpendicular directions resulted in a more uniform plant distribution than drilling once, but yield may have been limited by excess traffic from this seeding method. The best method to obtain a more uniform plant spacing may be seeding with a 3-inch drill.

Table 1. The influence of seeding method on yield, yield components, and plant characteristics of WestBred 881 and Aldura at the Greg Wuertz farm.

Cultivar	Seeding Method	Grain Yield	Kernel Weight	Head Size	Head Number	Plant Stand	Plant Height
		lb/A	g/1000	kernels/ head	heads/ ft^2	Plants/ ft^2	inches
WestBred 881	1X	5400	44.3	34.0	43.1	31.3	30.2
	2X	5370	45.4	33.0	39.9	28.0	30.5
Aldura	1X	5870	41.1	37.6	52.5	31.8	27.5
	2X	5890	41.4	36.2	51.2	30.4	26.9
FLSD .10		387	1.64	3.51	6.51	2.04	1.92

1X = drilled once

2X = drilled twice in parallel directions

Table 2. The influence of seeding method on yield, yield components, and plant characteristics of WestBred 881 and Aldura at the Arny Schlittenhart farm.

Cultivar	Seeding Method	Grain Yield	Kernel Weight	Head Size	Head Number	Plant Stand	Plant Height
		lb/A	g/1000	kernels/ head	heads/ ft^2	plants/ ft^2	inches
WestBred 881	Drilled	3570	44.2	45.4	23.4	13.7	26.1
	Broadcast	3420	40.8	45.4	23.5	7.9	26.4
Aldura	Drilled	3690	36.4	46.5	24.5	14.4	24.2
	Broadcast	3810	35.6	51.3	19.6	6.9	22.9
FLSD .10		NS	2.02	4.26	NS	1.89	1.68

Table 3. The influence of seeding method on yield, yield components, and plant characteristics of WestBred 881 at the John Klingenberg farm.

Seeding Method	Grain Yield	Kernel Weight	Head Size	Head Number	Plant Stand	Lodging
	lb/A	g/1000	kernels/ head	heads/ ft^2	plants/ ft^2	%
Drilled once	7033	52.3	37.4	38.0	12.0	20
Drilled twice, perpendicular	7225	52.0	39.4	40.5	9.8	14
FLSD .10	NS	NS	NS	NS	0.7	NS