

The Effect of Residue Management, Row Spacing, and Seeding Rate on Winter Canola Establishment and Survival

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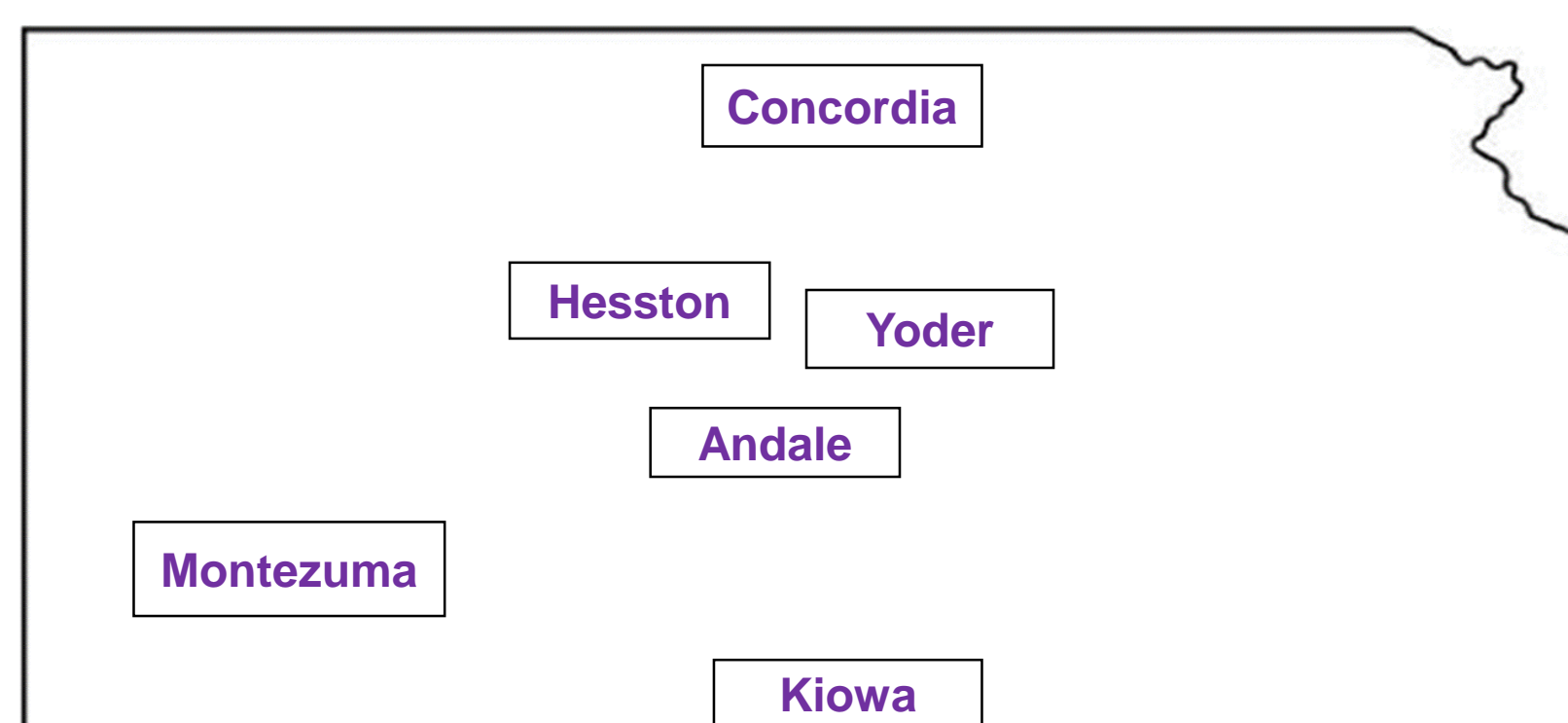
Introduction

- Winter survival of canola (*Brassica napus* L.) is a major challenge for producers using high-residue no-tillage systems.
- Large amounts of crop residue left in the seed row elevates the plant crown above the soil surface, decreasing chances of winter survival.
- Planters equipped with residue management systems can be a means of mitigating the effect of residue on winter survival and yield.

Objectives

- Determine the effect of row spacing and seeding density on stand establishment, winter survival, and yield.
- Compare AGCO Corps' innovative residue management system to canola producers' existing no-till residue management system.

Materials and Methods



- Six Kansas locations
- Randomized split block design with planting equipment as a split in each block and three replicates
- Plot size 9 m x 183 m
- Planted in wheat or corn residue
 - Sept-3-2014 to Sept-22-2014 based on geographical area
- Producer at Andale, KS location burned residue prior to planting
- Producer treatments at Andale, KS
 - John Deere 0.76-m row crop planter
 - Producer preferred seeding rate
 - Less 0.2 kg/ha of base rate
 - Plus 0.2 kg/ha of base rate
 - Cooperator preferred row spacing
- AGCO treatments at Andale, KS
 - AGCO Corp. planter with innovative residue management system
 - 0.5, 0.76-m row
 - 250,000, 370,000, and 495,000 seeds/ha
- Fall and spring stands recorded in four, 1-m lengths of row per plot
- Winter survival was calculated as spring plant stand/fall plant stand
- Plots were swathed on June-21-2015 and combined on June-25-2015 using commercial equipment
- Data analyzed with PROC MIXED in SAS 9.2, $\alpha = 0.1$

Results



Figure 1. Wheat residue at Kiowa, KS

- AGCO residue management system effectively cleared standing wheat residue from the seed row

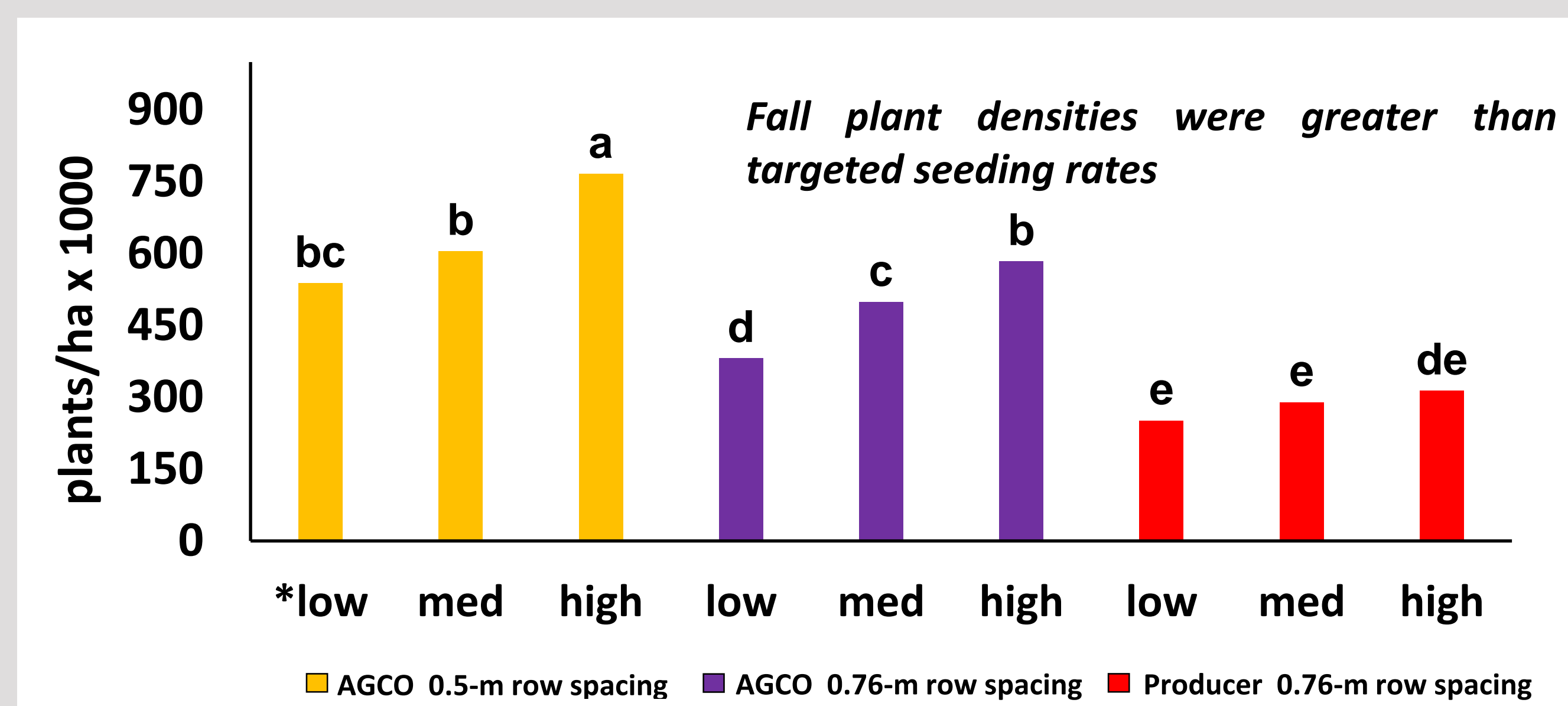


Figure 2. Fall plant stands at Andale, KS



Figure 3. Fall plant stands producer vs. AGCO at Andale, KS

- Vigorous fall growth in AGCO treatments



Figure 4. Spring plant stands at Kiowa, KS

- Five of the six locations were abandoned due to a rapid drop in temperature occurring in November after a period of above-normal fall temperatures.

Results cont.

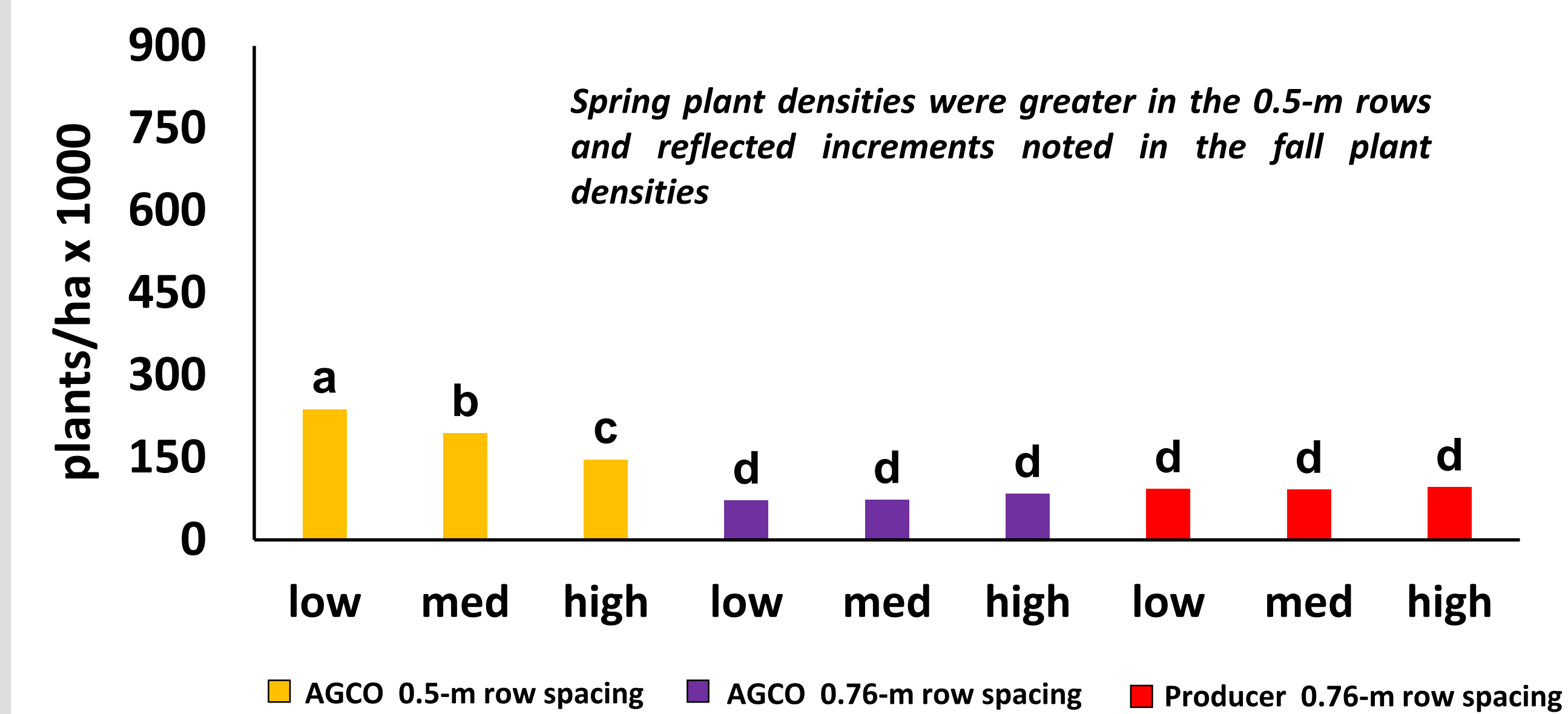


Figure 5. Spring stands Andale, KS

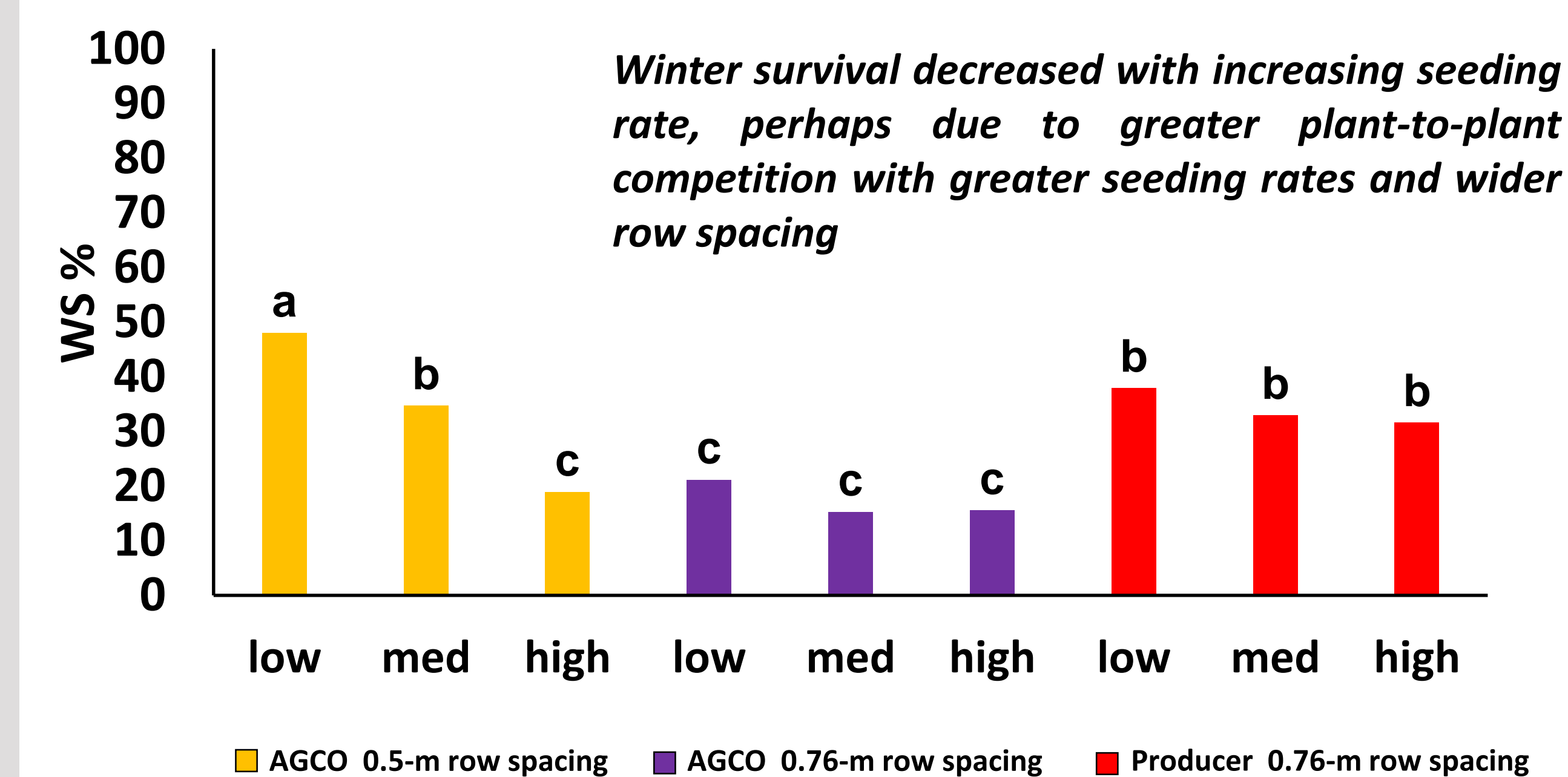


Figure 6. Percent winter survival at Andale, KS

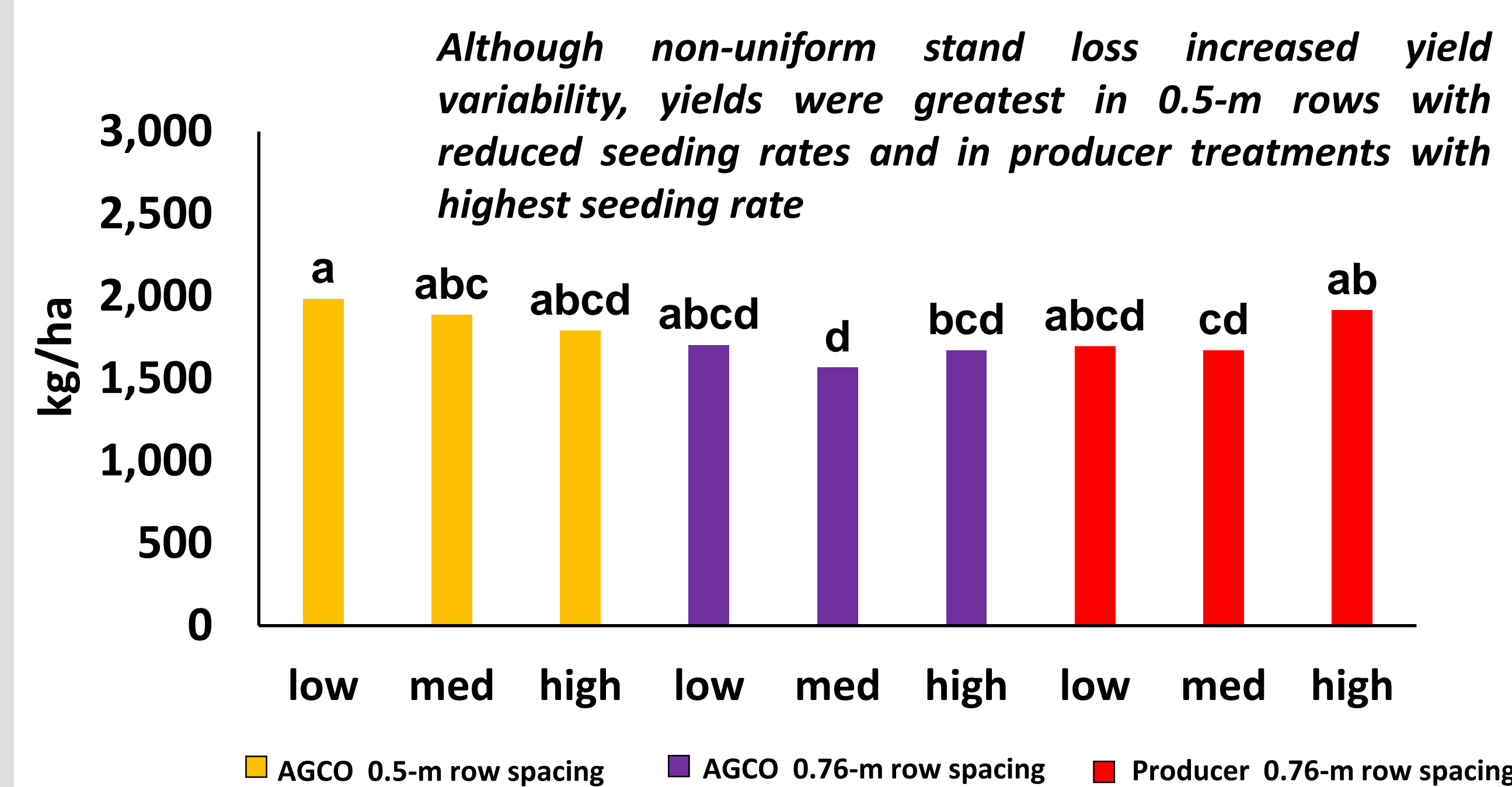


Figure 7. Grain yield at Andale, KS

*AGCO Low=247,000 Medium=371,000 High=494,000 seeds/ha
 *Farmer Low=415,000 Medium=465,000 High=539,000 seeds/ha

Conclusions

- Narrow row spacing paired with reduced seeding rates maximized winter survival and yield with the AGCO residue management system.
- AGCO residue management system with narrower row spacing and reduced seeding rates produced as good or better winter survival and yield when compared to producer residue burning practice.
- Canola planted with any residue management practice can be susceptible to winter kill if the plants are exposed to extreme weather events.