



VARIABLE RATE PLANTING EVALUATION

Variable rate inputs offer an attractive chance to focus production costs on areas (soil types, sub-field pockets, etc.) offering the historically greatest return. Planting equipment availability with variable rate capabilities is becoming more common and upgrading current equipment is easier than ever. The question often posed is: do these technologies pay for themselves and what strategy (how wide a spread, should averages vary for different products, etc.) should be implored to maximize both yield and economic return? We undertook a study in 2018 to compare 2 static rates against Variable Rate Planting (VRP) for 2 products to investigate product differences and strategy for variable rate success.

MATERIALS AND METHODS

A factorial randomized complete block (see Figure 1 for treatment list) study with 3 replications was undertaken comparing static 32,000 seeds/A; static 35,000 seeds/A; and Variable Rate Planting, VRP, (27 – 37,000 seeds/A) for 8E623RIB Brand Blend and 7E833RIB Brand Blend across 3 predominant soils near Versailles, OH. The site was selected so planting would cross soil changes as perpendicular as possible, creating relatively uniform comparisons within each replication (see Figure 1). The soil types were a Pewamo silty clay loam (4% Organic Matter, productive but very poorly drained), a Blount silt loam (2% Organic Matter, also very poorly drained, but with 2-4% slopes), and a ridge of Glynwood clay loam (1.5% Organic Matter, but eroded 6-12% slopes). The field was planted May 7th with a Precision Planting® Vset, Deltaforce® Planter and populations were confirmed after emergence. Yield data was collected with a calibrated monitor (average % error found to be 1.47% across 4 check loads) and recorded with Climate FieldView™. Analysis was performed with both Climate FieldView™ and Ag Leader® SMS™ Advanced. Analysis of Variance was performed and protected Least Significant Difference (LSD) was used to perform means separation.

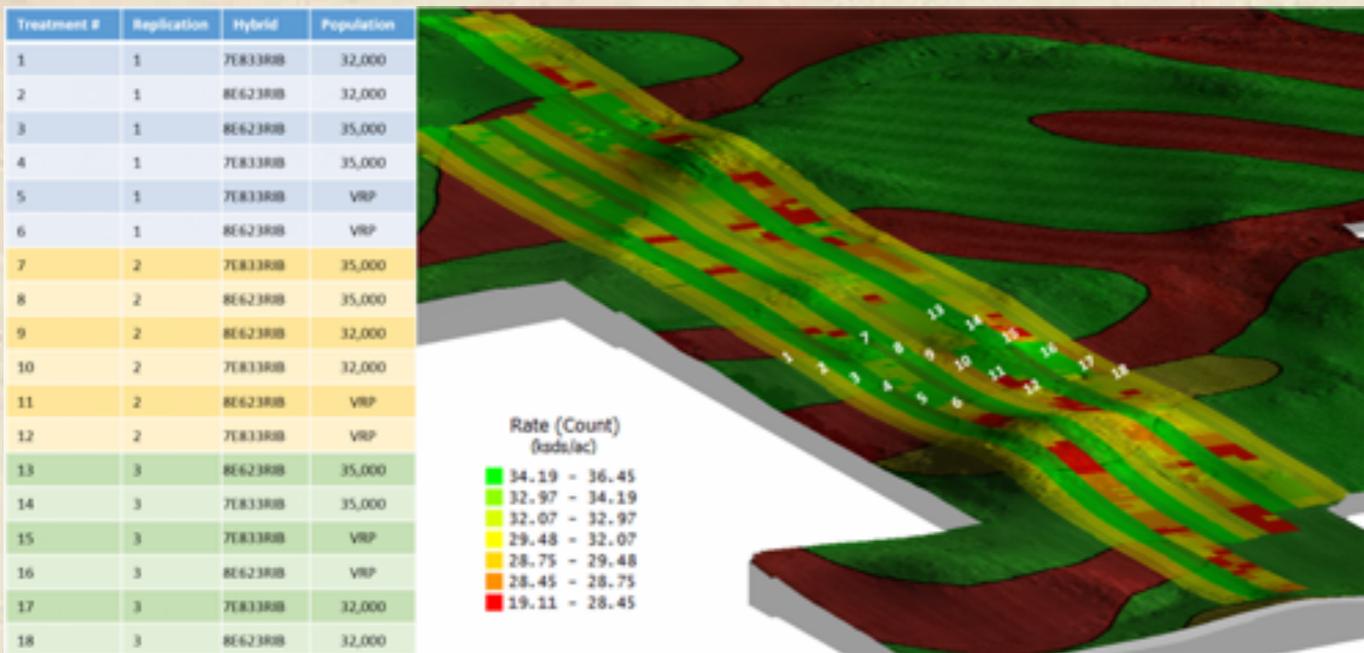


Figure 1. Layout of 2018 Variable Rate Planting Evaluation and as-planted rates. Variable Rate Planting (VRP) treatment ranged from 27 – 37,000 by anticipated yield levels.

RESULTS AND DISCUSSION

Script target seeding rate, as-applied planting rates and emerged populations corresponded in near perfect fashion. Rainfall totaled approximately 20" over the course of the season, but there weren't too many long stressful stretches without rain at this location (see Figure 2). Average yield for the trial was 241.4 bu/A and moisture varied only between products and was not significantly different for any of the population treatments (Table 1).



Figure 2. Growing Season accumulated rainfall (blue shape) compared against the 30-year average (gold line) for this field.

Within soil-type analysis, yield had shown for the VRP to always be statistically similar to the 32,000 and 35,000 seeds/A static rate strips, even when seeding rate was significantly reduced on hillside and other areas anticipated to yield less (data not shown). At this site and this year, 7E833RIB Brand Blend always yielded numerically more than the 8E623RIB Brand Blend. Especially on the wettest soil types and at the higher populations, 7E833RIB Brand Blend was dominant – this makes sense because 8E623RIB Brand Blend has shown to perform better without ‘wet feet’ and is less population responsive compared to 7E833RIB Brand Blend.

Across soil-type analysis, revealed no significant difference in yield across treatments, but there was a slight decrease in seed spend (Table 1). Variable Rate Planting achieved similar dry yields while saving seeding cost; meaning the average partial net profits per acre were always numerically better for the VRP. Partial net profits per acre were calculated as $(\text{Yield} * \text{Commodity price}) - \text{Seeding Cost} - \text{Drying Cost}^1$; where for analysis purposes, Commodity Price was assumed to be \$3.20, Seeding Cost was figured using \$230/unit, and Drying Cost was assumed to be \$0.04 per point with 15% as final moisture). 7E833RIB Brand Blend planted with VRP was an average of \$10.53/A more profitable than planting a static 32,000 seeds/A and an average of \$5.36/A more profitable than planting a static 35,000 seeds/A. 8E623RIB Brand Blend planted with VRP was an average of \$2.38/A more profitable than planting a static 32,000 seeds/A and \$9.99/A more profitable than planting a static rate of 35,000 seeds/A.





				SEEDING COST/A		YIELD		MOISTURE		PARTIAL NET PROFIT	
BRAND BLEND		AVERAGE PLANTED POPULATION		LSD ¹	2.73	NS		LSD ¹	0.26	NS	
7E833RIB	VRP	31,023		\$ 89.19	C	244.0	NS	16.4	A	\$ 691.55	NS
7E833RIB	32,000	32,090		\$ 92.26	B	241.7	NS	16.2	A	\$ 681.03	NS
7E833RIB	35,000	35,117		\$ 100.96	A	246.0	NS	16.2	A	\$ 686.19	NS
8E623RIB	VRP	30793		\$ 88.53	C	238.7	NS	15.9	B	\$ 675.17	NS
8E623RIB	32,000	31,993		\$ 91.98	B	239.0	NS	15.8	B	\$ 672.79	NS
8E623RIB	35,000	35,010		\$ 100.65	A	239.3	NS	15.9	B	\$ 665.18	NS
AVERAGE		32,671		\$ 93.93		241.4		16.1		\$ 678.65	

¹Significant @ p = 0.05

CONCLUSION

With the high yield and low stress levels of this year’s growing season at this research site, these results are a conservative look at the potential of VRP. Variable Rate Seeding can be a profitable venture that can support the cost of equipment setup – especially in the long term. Don’t be afraid to experiment with widely dynamic seeding scripts if you have appropriately accurate planting equipment and accompanying good planting conditions. Dynamic seeding scripts may be especially profitable in fields with variable soil types and yield potential. These results seem to agree with past (Lowenberg-DeBoer, 1999)² economic modeling and analysis that shows farms with at least 10% “low yielding” soil will see the best benefit from VRP. However, the present study indicates that yield levels of “low yielding” ground may not need to be under the 100 bu/A mark to see worthwhile benefits of VRP since this year even the eroded Glynwood clay loam averaged 234.6 bu/A. If you have questions about variable rate scripting, talk to your Stewart Seeds™ representative about Climate FieldView™ Advanced Scripting!

