

ECONOMIC RISK & PROFITABILITY OF SOYBEAN SEED TREATMENTS AT REDUCED SEEDING RATES

Adam P Gaspar*¹, Shawn P Conley¹, & Paul Mitchell²
¹Dept. of Agronomy, ²Dept. of Ag. & Applied Economics
Univ. of Wisconsin-Madison
*Corresponding Author: agaspar@wisc.edu

Proceedings

Earlier soybean [*Glycine max* (L.) Merr.] planting coupled with increasing seed costs and higher commodity prices has led to a surge in the number of hectares planted with seed treatments (Esker and Conley, 2012). Furthermore, recent studies have suggested that growers should consider lowering seeding rates to increase their return on investment (De Bruin and Pedersen, 2008; Epler and Staggenborg, 2008). Ultimately, growers would like to know the value proposition of combining seed treatments with lowered seeding rates. Therefore, the objectives of this study were to quantify the effects of seed treatments and seeding rates on soybean seed yield and assess the economic risk and profitability of seed treatments and seeding rates, including the calculated economically optimal seeding rate (*EOSR*) for each seed treatment.

Trials were conducted at nine locations throughout Wisconsin during the 2012 and 2013 growing seasons, totaling 18 site-years. Syngenta brand S20-Y2 (\$50 unit⁻¹) soybeans were treated with either no seed treatment (UTC), ApronMaxx (\$5 unit⁻¹) (mefenoxam + fludioxonil at 0.0094 mg ai seed⁻¹), or CruiserMaxx (\$12 unit⁻¹) (mefenoxam + fludioxonil + thiamethoxam at 0.0858 mg ai seed⁻¹) at six seeding rates of 40000, 60000, 80000, 100000, 120000, and 140000 seeds acre⁻¹. The analysis used a soybean grain sale price of \$12 bu⁻¹.

Results indicate differences in yield, profitability and economic risk due to seed treatment and seeding rate. ApronMaxx showed no improvements in yield or profitability at any seeding rate compared to the UTC. CruiserMaxx provided increased yields and profitability over the UTC at all seeding rates. CruiserMaxx showed increased yields over ApronMaxx at all seeding rates except 100,000 seeds acre⁻¹, but higher profits at all seeding rates. ApronMaxx and the UTC required higher seeding rates (>120,000 seeds acre⁻¹) to achieve break-even probabilities >0.50 and their *EOSR*'s showed the largest average profit increase for all outcomes over the base case. However, these average profit increases were minimal (<\$2 acre⁻¹). CruiserMaxx showed break-even probabilities >0.50 for all seeding rates except at 40,000 and 60,000 seeds acre⁻¹, but the lowest risk (0.87) and highest average profit increase (\$25 acre⁻¹) was achieved at its *EOSR* (101,000 seeds acre⁻¹), which was 18,000 seeds acre⁻¹ less than ApronMaxx and the UTC.

References

- De Bruin, J.L., and P. Pedersen. 2008. Soybean seed yield response to planting date and seeding rate in the upper Midwest. *Agron. J.* 100:696-703.
- Epler, M., and S. Staggenborg. 2008. Soybean yield and yield component response to plant density in narrow row systems. Online. *Crop Management* doi:10.1094/CM-2008-0925-01-RS.
- Esker, P., and S.P. Conley. 2012. Probability of yield response and breaking-even for soybean seed treatments. *Crop Sci.* 52:351-359.

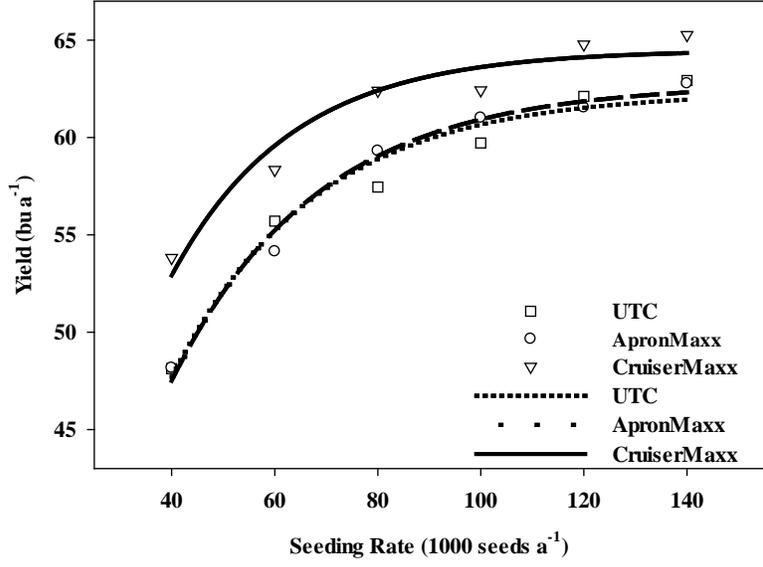


Figure 1. Yield modeled with a negative exponential model for three seed treatments across all seeding rates in 2012 and 2013.

Table 1. Seeding rate by seed treatment economic risk table for all location with a grain sale price of \$12 bu⁻¹.

Treatment combination [†]		Break-even probability [§]	Avg. profit increase over the Base Case [‡]		
Seed Treatment	Seeding Rate		Positive outcomes	All outcomes	Negative outcomes
Seeds acre ⁻¹		\$ acre ⁻¹			
UTC	120,000	0.77	3	2	-3
	100,000	0.44	4	-2	-7
	80,000	0.08	3	-17	-19
	60,000	0.00	1	-55	-55
	40,000	0.00	na [¶]	-138	-138
ApronMaxx	140,000	0.49	19	-1	-20
	120,000	0.52	19	1	-18
	100,000	0.44	17	-3	-19
	80,000	0.20	13	-18	-26
	60,000	0.01	8	-57	-57
	40,000	0.00	na	-142	-142
CruiserMaxx	140,000	0.76	27	17	-14
	120,000	0.84	29	23	-12
	100,000	0.87	30	25	-11
	80,000	0.80	26	18	-12
	60,000	0.38	16	-8	-22
	40,000	0.00	6	-79	-79
EOSR					
UTC	119,000	0.76	3	2	-3
ApronMaxx	119,000	0.52	19	1	-18
CruiserMaxx	101,000	0.87	30	25	-11

[†]Treatment combination includes all possible seed treatment and seeding rate combinations for comparison to the base case.

[‡]Base Case is untreated seed at 140,000 seeds acre⁻¹.

[§]Break-even probability is the probability a treatment combination will at least provide the same profit acre⁻¹ as the base case.

[¶]na, no outcomes are possible.