Maximizing Profit Through Smarter Seed Selection

Shannon Sand and Matt Stockton
April 3, 2025

University of Nebraska-Lincoln
West Central Research Extension Center

An Example of hybrid comparison

- Introduce the three factors of comparison
- Use those factors in making a comparison
- TAPS sprinkler irrigated corn contest North Platte, Ne (2018)
- Surprised at the amount of variation among hybrids and cultural practices

What is the value difference between hybrid's

- Calculating the difference in the cost of buying and seeding the respective hybrid's
- Identifying any cultural differences unique to the hybrid selected
- Account for any differences in productivity using its expected value

Hybrid value comparison (First)

- **Cost of planting difference**
  - Hybrid 1 cost of planting is $100/acre hybrid 2 is $120/acre, hybrid 1 is $20/acre cheaper to plant

Farm Number	Hybrid Number	Actual Seeding Costs $/Acre	Actual Population Seeds/Acre	Predicted Costs to Plant A1 $/Acre	Expected Planted Seeds/Acre	Savings/Loss Switching Costs/Gain Variety $/Acre
1	A1	$94.95	33,000	$94.95	33,000	$0.00
2	B1	$74.43	26,000	$96.96	33,700	-$22.53
3	B2	$107.11	34,000	$96.96	33,700	$10.15
4	B3	$98.27	33,000	$96.96	33,700	$1.31
5	B4	$94.25	28,000	$96.96	33,700	-$2.71
6	B5	$77.35	32,500	$96.96	33,700	-$19.61
7	B6	$120.05	34,000	$96.96	33,700	$23.09
8	B2	$103.96	33,000	$96.96	33,700	$7.00
9	B7	$100.98	30,000	$96.96	33,700	$4.02
10	B8	$99.66	33,500	$96.96	33,700	$2.70
11	B3	$103.20	32,000	$96.96	33,700	$6.24
12	A1	$97.82	34,000	$97.82	34,000	$0.00
13	A1	$97.82	34,000	$97.82	34,000	$0.00
14	B5	$71.40	30,000	$96.96	33,700	-$25.56
15	B9	$94.35	34,000	$96.96	33,700	-$2.61
16	B10	$99.20	32,000	$96.96	33,700	$2.24
17	A1	$96.38	33,500	$96.38	33,500	$0.00
18	A1	$97.82	34,000	$97.82	34,000	$0.00
19	B2	$107.11	34,000	$96.96	33,700	$10.15
20	B11	$129.24	31,000	$96.96	33,700	$32.28

Hybrid cultural differences (Second)

- What are the differences in growing the two hybrids
  - e.g. Hybrid 1 and hybrid 2 in this case have similar seed technology and don't require any cultural differences (However, in some cases hybrids may vary and require different insect, disease or herbicide applications which need to be considered)

Hybrid value comparison (Third)

- **The value of the productivity difference**
  - **e.g. Hybrid 1 produced 250 bu/acre, hybrid 2 produced 260 bu/acre. Hybrid 2 produced 10 more bu/acre, at a $4/bu value or $40 more /acre**

Forecasting each hybrid's performance

- To properly compare hybrid's their performance must be comparable
- TAPS provided an opportunity to do this since: All hybrids were repeatedly planted in randomly selected areas of the same field, during the same season at the same time

The creation of a model

- Using the A1 observations a forecast model for all other competitors' productivity can be made
- This is done by using the actual levels of irrigation and nitrogen used by each competitor
- The A1 base yield is 137.62 bu/acre and as such is the foundation of the forecast. (zero I or N)
- Each acre inch of irrigation increased productivity of the A1 hybrid by 11.6 bu/acre and it’s squared value reduced yield by -.877 bu/acre (diminishing returns to irrigation)
- Each pound of applied N fertilizer increased yield by .57 bu/acre

Forecast Demonstration

- Farm #4 – Hybrid B3
- Yield 248.6 bu/acre,
- Applied N 215 lbs/acre,
- Applied Irrigation 5.6 inches/acre
- Forecast yield if A1 were planted:
  - Added N, 215 times .57 equals 122.6 bu/acre
  - Added Irr., 5.6 acre inches times 11.6 bu/acre equals 64.8 bu/acre minus (5.62 squared acre inches) times -.877 bu/acre equals -27.5 bu/acre, with a net gain of 37.3 bu/acre for irrigation
  - The base yield for A1 is 137.6
- Forecast A1 yield for Farm #4 is 297.5 bu/acre, 48.9 bu/acre more then hybrid B3

	Actual	Expected	Hybrid	Yield
	Hybrid B	Hybrid A	Corn Seed	Difference
Farm #	Yields	Yields	Hybrid	Bu/Acre
1	274.6	272.2	A1	2.4
2	255.3	288.3	B1	-33.0
3	262.0	278.6	B2	-16.6
4	248.6	297.5	B3	-48.8
5	246.6	273.7	B4	-27.1
6	233.6	267.8	B5	-34.1
7	288.3	282.2	B6	6.1
8	240.3	292.3	B2	-52.1
9	270.0	304.1	B4	-34.1
10	273.6	285.0	B7	-11.3
11	257.3	278.5	B8	-21.2
12	137.6	137.6	A1	0.047
13	257.6	255.5	A1	2.1
14	260.6	280.4	B5	-19.8
15	279.0	283.7	B9	-4.8
16	240.0	258.9	B10	-18.9
17	222.3	222.8	A1	-0.5
18	264.3	267.6	A1	-3.3
19	256.6	281.7	B2	-25.1
20	272.0	288.3	B11	-16.3

Accounting for Bushel Value

- Price may change hybrid comparison outcome
- Farm #7 is the only farm where the yield of the B hybrid exceeded the A hybrid. B6 has a 6.1 bu/acre higher yield than A1.
- At the $3.22/bu the production value of 6.1 bu is $19.63/acre. This makes the A1 have a greater net return.
- When price near $3.79/bu or greater the B6 hybrid equals or outperforms the A1 hybrid

Table 3. Summary of costs savings/losses, increased/decreased revenues and profit changes for all switched variety B's, farm 1, 12, 13, 17 and 18 were not switched and were omitted from the table

Farm Number	Variety Identification Number (VIN)	Costs Savings/Loss From Variety Switch $/Acre	Revenue Change From Production Difference $/Acre	Profit Change From Variety Switch $/Acre
2	B1	$ (22.53)	$ 105.64	$ 83.11
3	B2	$ 10.15	$ 53.14	$ 63.29
4	B3	$ 1.31	$ 156.26	$ 157.57
5	B4	$ (2.71)	$ 86.72	$ 84.01
6	B5	$ (19.61)	$ 109.22	$ 89.61
7	B6	$ 23.09	$ (19.63)	$ 3.46
8	B2	$ 7.00	$ 166.58	$ 173.58
9	B7	$ 4.02	$ 109.15	$ 113.17
10	B8	$ 2.70	$ 36.27	$ 38.98
11	B3	$ 6.24	$ 67.74	$ 73.98
14	B5	$ (25.56)	$ 63.22	$ 37.66
15	B9	$ (2.61)	$ 15.34	$ 12.73
16	B10	$ 2.24	$ 60.52	$ 62.76
19	B2	$ 10.15	$ 80.23	$ 90.38
20	B11	$ 32.28	$ 52.31	$ 84.59

Thank-You