

Researching Barley Insurance Options: A RightRisk™ Lesson Guide with Mountain View Farms

by Jay Parsons

Barley insurance in the Mountain View Farms Ag Survivor scenario is offered in three forms: MPC (Multi-Peril Crop Insurance), IP (Income Protection insurance), and RA (Revenue Assurance insurance). You also have the option of adding an Option B endorsement for your malt barley acres.

Your current APH (average production history) is 45 bushels to the acre. The MPC policies are offered with a price level of \$2.80 per bushel, the IP policies have a price level of \$3.54, and the RA policies have a price level of \$2.74. Option B adds a \$0.90 price level premium for planted malt barley acres.

MPC provides protection only against downside yield risk. IP and RA provide protection against both yield and price risk, albeit at different price levels. The more protection a policy provides, the more expensive it is to obtain. That is why MPC will always be the least expensive of these three forms of insurance and IP, with the significantly higher price level of \$3.54, is the most expensive by quite a large margin.

Option B provides added protection against malt barley quality losses. The base policies will protect against actual barley yield losses but some of the malt barley acres may produce bushels of barley that do not meet malting standards. If the actual bushels produced meeting malting barley quality standards falls below the guaranteed bushels insured, then that deficiency is compensated at a rate of \$0.90 per bushel with an Option B endorsement on top of the base policy. The premium rate for the Option B endorsement varies depending upon the base policy it is attached to so the added cost for this added protection will vary slightly depending upon your base policy choice.

So, which barley insurance option should you choose? Or, should you not insure your barley at all? Keep in mind that risk decisions are largely a matter of preference. Often, there are no clear cut best choices staring you in the face.

For example, suppose your last five years of production have resulted in average barley yields of 20, 37, 58, 44, and 59 bushels to the acre. In addition, the year that yield was 44 bushels to the acre, 40% of the malting barley production did not meet malting quality standards. Looking at these last five years, a person might attach a 40%

Risk decisions are largely a matter of preference.

Some people will focus on the high probability and magnitude of the indemnity payouts while others will focus on the lower premium costs.

probability to achieving a yield of approximately 58 bushels to the acre, a 40% probability of yield around 40 bushels to the acre, and a 20% probability of getting only 20 bushels to the acre. Also, suppose you think there is an equal probability of feed barley prices being \$2.55, \$2.30, or \$2.20 per bushel at harvest. Combining these three price possibilities with the aforementioned three approximated yield outcomes produces nine different price/yield outcomes to consider. Adding in a 20% probability of suffering significant malt barley quality issues would double this total to 18 possible outcomes.

For simplicity, let's ignore the malt barley quality issue and focus on the choice between the three base policies given our nine different price/yield outcomes we're considering as possibilities.

Columns 5 and 6 of Table 1 enumerate the nine different revenue possibilities and the associated probabilities of occurrence given the situation we've depicted (ignoring the malt barley quality issue). Given our three insurance policy choices of MPC, IP, and RA (without Option B), we can calculate per acre indemnities for each of the nine outcomes in Table 2.

Table 1: Outcomes

Column	1	2	3	4	5	6
Outcome	Yield	Probability	Price	Probability	Yield*Price	Probability
1	58	40%	2.55	33%	\$ 147.90	13%
2	58	40%	2.30	33%	\$ 133.40	13%
3	58	40%	2.20	33%	\$ 127.60	13%
4	40	40%	2.55	33%	\$ 102.00	13%
5	40	40%	2.30	33%	\$ 92.00	13%
6	40	40%	2.20	33%	\$ 88.00	13%
7	20	20%	2.55	33%	\$ 51.00	7%
8	20	20%	2.30	33%	\$ 46.00	7%
9	20	20%	2.20	33%	\$ 44.00	7%

Table 2: Indemnities

Insurance Alternative		1	2	3
Outcome	Probability	MPC	IP	RA
1	13%	0	0	0
2	13%	0	0	0
3	13%	0	0	0
4	13%	0	17.65	0
5	13%	0	27.65	0.61
6	13%	0	31.65	4.61
7	7%	38.64	68.65	41.61
8	7%	38.64	73.65	46.61
9	7%	38.64	75.65	48.61

The indemnities in Table 2 come with a premium cost attached to them associated with the chosen policy. Those premiums range from a low of \$5.93 per acre for MPC to a high of \$11.58 per acre for IP with RA insurance costing \$6.59 per acre.

Adding the indemnities of Table 2 to column 5 of Table 1 and subtracting off the appropriate premium cost, we can produce the “payoff matrix” in Table 3 for the three insurance policy alternatives together with the alternative of not insuring at all.

Table 3: Payoff Matrix

Alternative		1	2	3	4
Outcome	Probability	MPCI	IP	RA	None
1	13%	\$ 141.97	\$ 136.32	\$ 141.31	\$ 147.90
2	13%	\$ 127.47	\$ 121.82	\$ 126.81	\$ 133.40
3	13%	\$ 121.67	\$ 116.02	\$ 121.01	\$ 127.60
4	13%	\$ 96.07	\$ 108.07	\$ 95.41	\$ 102.00
5	13%	\$ 86.07	\$ 108.07	\$ 86.02	\$ 92.00
6	13%	\$ 82.07	\$ 108.07	\$ 86.02	\$ 88.00
7	7%	\$ 83.71	\$ 108.07	\$ 86.02	\$ 51.00
8	7%	\$ 78.71	\$ 108.07	\$ 86.02	\$ 46.00
9	7%	\$ 76.71	\$ 108.07	\$ 86.02	\$ 44.00
Expected Value		\$ 103.32	\$ 114.73	\$ 104.75	\$ 101.52

Notice that the effect of insurance is consistent in that it “tightens up” the distribution of outcomes. If yield is high (outcomes 1-3), none of the insurance policies yield an indemnity payment. So, the highest revenue values in Table 3 occur at the top of column 4 where not insuring saves you the cost of a premium. Similarly, the worst outcomes occur when yield is the lowest (outcomes 7-9). When this occurs, all of the insurance policies pay an indemnity which adds to the lowest revenue values occurring at the bottom of column 4. So, each of the insurance policies produces a payoff distribution that contains neither the highest of the highs nor the lowest of the lows. The decision really does boil down to a matter of preference. Some people may focus on the high probability and the magnitude of indemnity payouts associated with IP insurance. Others may focus on the low cost of MPCI and RA insurance or the possibility of not insuring at all.

Currently, in the United States, these insurance policies are heavily subsidized by the government in terms of premium costs. In a normal insurance market, a person would expect that the expected payoff for column 4 of Table 3 would exceed the expected values of columns 1-3 associated with purchasing insurance. However, because of the premium subsidies, that is not the case here in this example nor is it usually the case in current reality. Policies, price, and yield expectations change on a regular basis though, so, it’s important to remain informed and consistently evaluate your decision alternatives in light of the current information you have available and the risks that you face.

By Jay Parsons

Copyright © 2009 RightRisk All Rights Reserved

Additional Resources

Barley Income Protection. USDA – Risk Management Agency. December 2008. Commodity Insurance Fact Sheet. http://www.rma.usda.gov/fields/wa_rso/2009/barleyip.pdf (accessed 1/7/2009).

Revenue Assurance: Malting Barley Price and Quality Endorsement. Publication 03-RA-MBarley-QE. <http://www.rma.usda.gov/Policies/2003/ra/PDF/03rambarleyqe.pdf> (accessed 1/7/2009).

Small Grains Crop Insurance: Malting Barley Price and Quality Endorsement. USDA-Federal Crop Insurance Corporation. Publication 96-91B. <http://www.rma.usda.gov/policies/1996/crops/pdf/9691B-mb.pdf> (accessed 1/7/2009).



Funding for this lesson guide was provided in part by the Western Center for Risk Management Education at Washington State University under agreement with the Idaho Barley Commission.

Copyright © 2009 RightRisk All Rights Reserved
