FARM BUSINESS MANAGEMENT

FARM ECONOMICS Facts & Opinions

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Expected Yield Increases and Choice between Group and Farm Crop Insurance

The Risk Management Agency (RMA) increased the expected yields used to calculate guarantees for Group Risk Plan (GRP) and Group Risk Income Plan (GRIP), group insurance products that base payments on county yields. Increases in expected yields from 2005 to 2006 averaged 7.6 bu. for corn and 1.6 bu. for soybeans across all Illinois counties. Higher expected yields result in higher guarantees. Higher guarantees then increase chances of receiving insurance payments and increase the amount of payments when they occur. Thus, expected yield increases make group products more attractive and may cause some farmers to switch to group products from farm products such as Actual Production History (APH), Crop Revenue Coverage (CRC), Income Protection (IP), and Revenue Assurance (RA).

Expected Yields and Group Product Guarantees

GRP is a yield insurance whose guarantee equals the expected yield times the coverage level. An expected yield of 171.5 bu. and a coverage level of 90% results in a yield guarantee of 154.4 bu. (171.5 x .90). Payments occur when county yield, as determined by the National Agricultural Statistical Service (NASS), is less than 154.4 bu.

GRIP is revenue insurance that has two options: GRIP without the harvest revenue option (GRIP-NoHR) and GRIP with the harvest revenue option (GRIP-HR). GRIP-NoHR's revenue guarantee equals the expected price times the expected yield times the coverage level. The expected price is the average of settlement prices of Chicago Board of Trade (CBOT) contracts during the month of February (December contract for corn and November contract for soybeans). Given an expected price of $2.40, an expected yield of 171.5, and a coverage level of 90%, the guarantee equals $370 ($2.40 x 171.5 x .9).

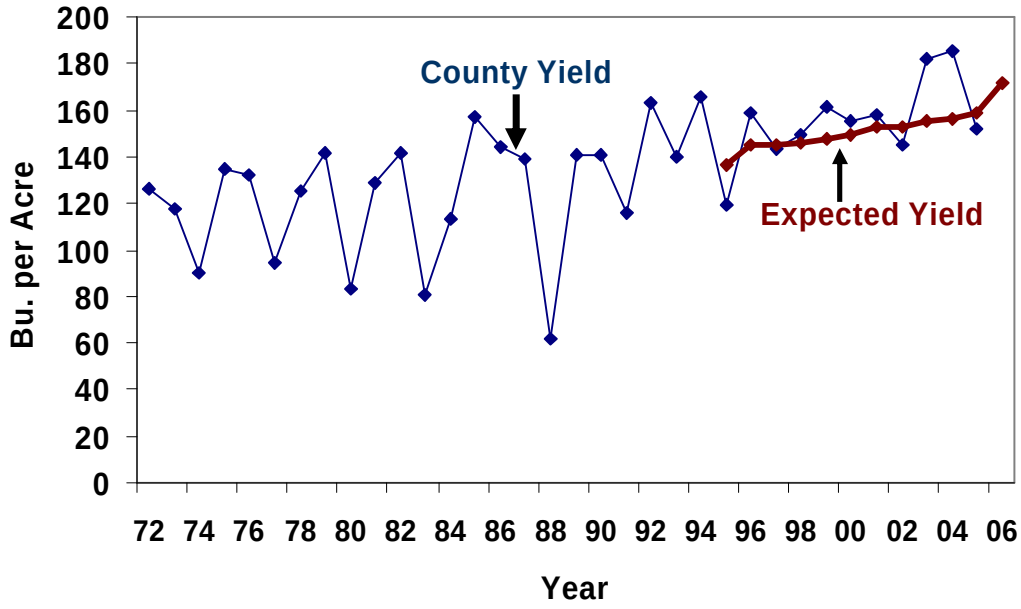
GRIP-NoHR makes payments when the actual county yield times the harvest price is below the revenue guarantee. For corn, the harvest price is the average of settlement prices during the month of October of the December CBOT contract. The harvest price is limited to a $1.50 move from the expected price (the harvest price can not be less than $1.50 plus the expected price or greater than $1.50 plus the expected price). For soybeans, the harvest price is the average of settlement price during October for the November contract. The harvest price is limited to a $3.00 move from the expected price for soybeans.

GRIP-HR's revenue guarantee differs from GRIP-NoHR in that the higher of the expected price or the harvest price is used in calculating the guarantee. GRIP-HR's guarantee will always be at least as high as GRIP-NoHR's guarantee. Hence, payments from GRIP-HR will be at least as great as from GRIP-NoHR, given that similar coverage and protection levels are chosen.

Expected Yield Increases

To put expected yield increases in perspective, county corn yields for McLean County, Illinois are shown in Figure 1. Actual county yields as determined by NASS are shown for 1972 through 2004. The 2005 yield has not been released as of the writing of this paper. The 2005 yield was estimated based on yields reported for the Central Crop Reporting District.

Figure 1. McLean County Corn Yields and Expected Yields, 1972 - 2006.



Also shown in Figure 1 are expected yields used in the calculating group product guarantees. These expected yields are RMA's estimate of the "most-likely" yield in a county. If a year could be repeated a number of times, the average of the repeated years would equal the most-likely yield. In 2006, the expected county yield is 171.5 bu. for McLean County. If 2006 could be repeated ten times, the average of the ten years would be close to 171.5 bu. if RMA is correct in its estimate of the expected yield.

GRP became available in 1995 and had an expected yield of 136.9 in that year. Expected yields gradually increased up until 2005 when the expected yield was 159.1 bu. Between 2005 and 2006, the expected yield had a substantial increase of 12.4 bu. up to 171.5 bu. Note that the 171.5 expected yield is higher than all county yields except two: the 2003 and 2004 yields.

The substantial increase occurred because RMA appears to place large weights on yields of recent years. When the 2006 expected yield was calculated by RMA, yields up to 2004 were available. The 2003 yield of 182 bu. and the 2004 yields of 185 bu. were substantially higher than any other previous yield (see Figure 1). These recent high yields caused the expected yield to increase.

Corn yields have been increasing at a faster pace since 1995 than prior to 1995. For McLean County, the average yearly increase in corn yields was 3.3 bu. between 1995 through 2005 compared to 1.8 bu. between 1973 through1995. There is some argument whether these increases are due to improved genetics and the introduction of genetically modified hybrids or whether the increases are simply due to favorable weather. If due to favorable weather, the expected yields may overstate most-likely yields.

APH Yields of Farm Products

Expected yield calculations stand in contrast to the way in which APH yields are calculated. The APH yield is used to set guarantees on farm products (APH, CRC, IP, and RA) and is based on a yield history from a farm or a unit. The yield history can be based on a minimum of four yields up to a maximum of eleven consecutive yields. Due to yield variability, a farm's APH yield can be substantially different from the most-likely yield. In some cases APH yields will be higher than expected yields and vice versa. While the relationship may vary on individual farms, calculating the APH yield based on a yield history will result in the average APH yield being below the most-likely yield in an environment of increasing yields.

To gain a feel for the downward bias, average yields for the last five years (2001 through 2005) and last ten years (1996 through 2005) were calculated for McLean County. These would be the APH yields for a farm that had the same yields as the county and had yields based on five-years of yields and ten-years of yields, respectively. Overall, one would expect these averages to be close to the average of APH yields in McLean County. The five-year average yield for McLean County was 165 bu., 6.5 bushels below the 2006 expected yield. This suggests that, on average, farms with APH yields based on 4 to 6 years of yields will have APH yields about 6.5 bu. below most-likely yields. The ten-year average yield was 155.6 bu., 15.9 bu. below the 2006 expected yield. This suggest that, on average, farms with APH yields based on between 9 and 11 years of data will have APH yields about 15.9 bu. below most-likely yields.

Relationships between expected and average yields for McLean County are not unique. Across all Illinois counties, the 2006 expected yield for corn is 2.6 bu. higher than the five-year average yield (see Table 1). The 2006 expected yields averaged 14.7 bu. higher than the ten-year average yields across all Illinois counties.

Choice of Group or Farm Product

Having APH yields substantially below most-likely yields greatly reduces the chances of receiving payments from insurance products. This reduces risk reductions offered by crop insurance. Hence, farmers may wish to compare their APH yields to what they would consider most-likely yields. If APH yields are below most-likely yields, group products become more attractive compared to farm products. Conversely, farm products will be more attractive than group products when APH yields are above most-likely yields.

The comparison of most-likely to APH yields should be only one consideration in the crop insurance choice decision. Another should be the financial position of the farm. Farms in vulnerable financial position will find farm products more attractive because farm products use farm yields in calculating insurance payments. Another criterion should be how well farm yields track county yields. Farms who have yields that closely track the county will find group products more attractive.

Summary

The increase in 2006 expected yields increases the attractiveness of group products. Farmers may want to compare there APH yield to the most-likely yield. Group products become more attractive as the APH yield declines relative to the expected yield.

Increases in expected yields may be a short lived phenomenon. Expected yields can decrease if county yields are below average in future years.

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Table 1. Average and Expected Yields for Illinois Counties, 2006.

County	5-Year Average[1]	10-Year Average[2]	RMA Expected Yields[3] 2005	RMA Expected Yields[3] 2006	County	5-Year Average[1]	10-Year Average[2]	RMA Expected Yields[3] 2005	RMA Expected Yields[3] 2006
Adams	164	144	154.8	164.0	Lee	161	151	158.4	161.6
Alexander	129	114	NA	NA	Livingston	154	141	146.7	157.6
Bond	129	116	125.4	131.2	Logan	168	156	165.2	176.1
Boone	144	137	142.1	147.1	Macon	170	161	170.4	179.4
Brown	156	138	148	154.1	Macoupin	161	146	155.8	164.5
Bureau	167	153	158.6	167.9	Madison	145	132	144.3	148.1
Calhoun	135	127	133.4	140.1	Marion	122	110	115.3	123.6
Carroll	167	154	161.9	171.2	Marshall	162	151	154.4	168.1
Cass	169	151	161.4	169.6	Mason	154	143	150.7	161.4
Champaign	160	149	153.2	164.0	Massac	113	104	109.3	115.7
Christian	171	157	167.3	174.6	McDonough	172	157	162.2	177.0
Clark	151	135	145.4	151.1	McHenry	132	130	136.9	136.2
Clay	125	110	112.6	123.9	McLean	163	154	159.1	171.5
Clinton	127	113	121.7	127.8	Menard	170	155	166	174.3
Coles	164	149	159	167.0	Mercer	166	150	150.1	164.2
Cook	118	115	NA	NA	Monroe	137	120	123.9	129.4
Crawford	138	123	128.9	135.7	Montgomery	159	143	152.9	159.1
Cumberland	147	130	141.1	145.7	Morgan	174	156	164.6	173.1
DeKalb	157	150	157.6	158.9	Moultrie	165	152	160.3	166.4
De Witt	161	155	160.3	172.0	Ogle	156	147	155.2	159.2
Douglas	160	144	149.8	161.0	Peoria	167	153	162.3	170.7
Du Page	128	127	NA	NA	Perry	99	87	93.6	95.3
Edgar	159	144	154.1	161.4	Piatt	166	156	163.7	173.9
Edwards	121	117	120.5	127.0	Pike	160	145	156.2	163.3
Effingham	136	121	128.4	135.6	Pope	106	91	NA	NA
Fayette	130	120	127	134.4	Pulaski	125	115	NA	129.3
Ford	155	142	150.9	159.8	Putnam	165	154	161.8	171.4
Franklin	103	93	98.3	105.1	Randolph	110	99	104.8	109.2
Fulton	161	146	154.6	163.2	Richland	122	108	111.8	120.6
Gallatin	136	124	134.8	138.8	Rock Island	164	150	156.7	164.8
Greene	154	141	153.3	158.5	Saline	118	105	112.5	120.3
Grundy	153	141	148.6	157.7	Sangamon	174	159	170.1	175.7
Hamilton	114	108	113.9	121.2	Schuyler	162	144	159.1	166.3
Hancock	165	148	149.5	164.5	Scott	163	146	154.7	163.6
Hardin	106	98	NA	NA	Shelby	149	136	143.9	150.1
Henderson	163	151	152.9	163.6	St. Clair	136	127	136.1	140.4
Henry	163	149	152.8	163.2	Stark	169	157	164.4	173.4
Iroquois	158	146	148.5	162.8	Stephenson	150	141	145.4	153.3
Jackson	121	104	113.3	117.2	Tazewell	167	153	160.6	172.7
Jasper	140	123	128.3	135.6	Union	120	111	NA	123.7
Jefferson	110	99	100.9	107.9	Vermilion	153	141	147.3	155.4
Jersey	149	139	149.6	155.2	Wabash	129	122	128.3	134.6
Jo Daviess	145	137	142.8	147.9	Warren	172	158	159.6	173.3
Johnson	118	101	NA	NA	Washington	117	107	113.4	123.3
Kane	148	145	153.3	152.2	Wayne	121	110	114.1	124.4
Kankakee	149	138	139.8	152.9	White	128	118	131.7	136.0
Kendall	148	138	145	150.4	Whiteside	157	147	151.3	156.8
Knox	171	156	158.8	173.8	Will	140	131	138.2	143.3
La Salle	156	145	151.5	157.1	Williamson	96	87	102.8	97.5
Lake	109	104	103.2	108.4	Winnebago	133	132	135.2	139.6
Lawrence	132	118	124.7	131.2	Woodford	169	156	165.5	174.1

[1] Average yield for 2000 through 2004., [2]Average yield from 1995 through 2004.

[3] Expected yields used to set guarantees for group crop insurance products.