Actual Production History: New Citrus Fruit Insurance Policy

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During the 2021/22 citrus season, the Risk Management Agency (RMA) started offering a new option to Florida citrus growers for insuring their crop. The (new to Florida citrus) policy is called Actual Production History (APH) and provides coverage for yield losses based on a farm's historical records. This is in contrast to the Citrus Fruit Dollar Amount policy that offers coverage based on a reference maximum dollar amount per acre established by RMA. And, while the Whole Farm Revenue Protection (WFRP) policy also uses farm records as a basis for coverage, such a coverage is against losses in farm revenue and eligibility is limited to operations with an expected revenue under $1 million.

APH coverage levels range from 50% to 85% in 5% increments. Causes of insurable loss under this policy include adverse weather, fire, diseases (if specified in the special provisions) and postbloom fruit drop due to adverse weather. Coverage is offered for fresh and processed oranges and grapefruit, fresh mandarins/tangerines, tangelos and tangors grown in central and southwest Florida counties. Coverage for fresh and processed lemons is available in some counties. The price used to establish the premium and liability amount for each combination of crop, type, and grove practice is set by the Federal Crop Insurance Corporation (FCIC). Growers can elect to insure at a lower price than established or, alternatively, can provide a contract price, if available.

The basis to establish the guarantee and premium in APH is called the APH approved yield, which consists of the average of the grower's yield records for the last 10 seasons. Growers need to provide at least four years of yield records to obtain APH coverage. If such records are not available, the grower will be assigned transitional yields (T-yields) —an estimated yield figure based on historical average county yields— for each missing year. The number of years for which the grower has records available will determine what percentage of transitional yield is used to complete the missing years (see table 1).

Issues with the APH policy; benefits to growers

Given HLB and its continuous negative impact on citrus yield in Florida, pounds solids and the number of boxes per acre have been trending downward since 2005. Thus, the implementation of APH for citrus in Florida is deficient from an actuarial standpoint because it is offering coverage based on past seasons' yields despite the downward trend. This causes the guarantees to be higher than what they would be if the downward trend were considered. Therefore, at the present time, obtaining coverage under APH will likely be beneficial for growers. To illustrate this, in Table 2, we use yield records for Early and Mid-season oranges in Polk County since season 2010/11 to compute indemnities for the average county grower as if the APH program had been available during previous seasons.

Columns (2) and (3) in Table 2 show the actual yield each season in Polk County and the percent decrease relative to the previous season, respectively. Columns (4) and (5) show the APH approved yield that RMA would compute as the 10-year average and the percent

decrease in yield relative to the APH yield, respectively. The values for the percent decrease in yield relative to the APH approved yield (column 5) are significantly higher than the percent decrease in actual yield (column 3) for most seasons. In fact, for some seasons, such as 2016/17, 2018/19 and 2019/20, yield increased relative to the previous season but decreased relative to the APH yield calculation, so, depending on the selected coverage, some growers would have still been compensated.

Columns 6, 8, and 10 in Table 2 show the APH guarantees at the 65, 75 and 85 percent coverage level each season. Had the program been available during previous seasons and the hypothetical grower had chosen, for example, 65% coverage, the grower would have obtained compensation in five out of the last 10 seasons because yield in column 2 is lower than the 65% APH guarantee in column 6. Had the grower selected 75% coverage, the grower would have obtained compensation in seven out of the last 10 seasons. And, had the grower selected 85% coverage, the grower would have obtained compensation in nine out of the last 10 seasons. Columns 7, 9, and 11 in Table 2 illustrate what the compensation would have been at the 65, 75, and 85 percent coverage level, respectively, in terms of boxes per acre each season. The dollar amount of the compensation would have depended on the price established by the FCIC each season.

Continuing with the example of a hypothetical representative one acre grove in Polk County, we use the USDA-NASS forecasted average state yield for the 2021/22 season of 131 boxes per acre for Early and Mid-season oranges as a proxy for the county yield to illustrate the calculations for the premium and indemnity (in dollars). Such a yield represents a 20% reduction relative to last season's yield (Table 2 column 3) but a 46% reduction relative to the approved yield (Table 2 column 5). Assuming the grower chose 65% coverage, the guarantee would be set at 158 boxes per acre (Table 2 column 6). Had the grower chosen 75% coverage, the guarantee would have been set at 182 boxes per acre (Table 2 column 8). And, had the grower chosen 85% coverage instead, the guarantee would have been set at 206 boxes per acre (Table 2 column 10).

In Table 3 we show the amounts of the APH premium and indemnity at the 65, 75, and 85 percent coverage levels. Table 3 panel A shows the values needed for computing the premium rate and indemnity. For example, the FCIC established the price for Early and Mid-season oranges at $10.83 per box. Therefore, the value of production per acre is $2,632 (=$10.83 per box $*$ 243 boxes per acre). The realization of yield in 2021/22 at 131 boxes per acre would imply that there was a loss of 46% relative to the APH yield. Thus, the value of the production to count and the loss value would be $1,419 per acre and $1,213 per acre, respectively. Table 3 panel B shows the liability and deductible amounts as well as the amounts for the farmer premium and indemnity for the three different coverage levels. Panel B shows that a grower choosing 65% (75%) [85%] coverage would have had to pay $22 ($53) [$137] per acre as the premium and should the grove's yield in 2021/22 be 131 boxes per acre the grower would receive $292 ($552) [$823] per acre as indemnity.

The APH policy also offers the possibility of adding additional options for coverage. Two of the options that exacerbate the issue of higher guarantees are the *Yield Cup* and *Yield Exclusion*. Yield Cup prevents APH yield from decreasing by more than 10% in any year,

which makes the guarantees higher and, thus, increases the amount of indemnities, but it also has a higher premium because it is based on the effective coverage the grower obtains. Yield Exclusion allows excluding catastrophic years from the APH yield calculation in exchange for a higher premium based on effective coverage. While future potential adjustments by RMA to address the issue of higher guarantees are possible, there are no details regarding how they will work or how soon (or often) they will be implemented. Therefore, given the increasing negative impact of HLB, obtaining coverage under APH will likely be beneficial to growers until such adjustments are implemented, and increasingly so for higher levels of coverage.

Summary

The Actual Production History (APH) policy offers coverage against yield losses based on historical farm records. Given the negative impact of HLB on Florida citrus yield and the reliance of APH on the average record of yield for the previous 10 seasons, the APH guarantees are higher than what they would be if the downward trend was taken into account. For growers, this means that until such an issue is corrected, obtaining coverage under APH will likely be beneficial.

Table 1. Actual Production History (APH) transitional yield (T-yields) percentage used to complete a grower's database when at least 4 yield records are not available

Number of years with yield records	Percentage of Transitional yield (T-yield) used
0	65%
1	80%
2	90%
3	100%

Table 2. Historical yield, Actual Production History (APH) yield, and 65, 75, and 85 percent coverage level guarantees for Early and Mid-season Oranges in Polk County, Florida

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Season	**Yield (in boxes per acre)**	**Decrease in yield (%)**	**APH yield (in boxes per acre)**	**Decrease in yield relative to APH (%)**	**APH 65% guarantee**	**Indemnity for 65% coverage (in boxes per acre)**	**APH 75% guarantee**	**Indemnity for 75% coverage (in boxes per acre)**	**APH 85% guarantee**	**Indemnity for 85% coverage (in boxes per acre)**
2010/11	413	6%	424	-3%	276	0	318	0	360	0
2011/12	437	6%	423	3%	275	0	318	0	360	0
2012/13	341	-22%	419	-19%	273	0	315	0	356	16
2013/14	293	-14%	409	-28%	266	0	307	14	348	55
2014/15	245	-16%	385	-36%	250	5	289	44	327	82
2015/16	182	-26%	378	-52%	246	64	284	102	322	139
2016/17	203	11%	353	-42%	229	26	265	62	300	97
2017/18	142	-30%	342	-59%	223	81	257	115	291	149
2018/19	207	46%	312	-34%	203	0	234	27	265	58
2019/20	214	3%	285	-25%	185	0	214	0	242	28
2020/21	164	-23%	268	-39%	174	10	201	37	228	64
2021/22*	131	-20%	243	-46%	158	27	182	51	206	75

* This is based on the latest USDA-NASS forecast for the state of Florida

Table 3. Actual Production History (APH): Example for the calculation of the premium and indemnity for the 2021/22 season for 65, 75, and 85 percent coverage for Early and Mid-season oranges in Polk County.

A. Parameters needed for computing the APH premium rate and indemnity

Price per box	$10.83
APH Yield 2021/22	243
Value of production	$2,632
Actual yield in 2021/22	131
Production damage	46%
Value of production to count	$1,419
Loss value	$1,213

B. APH Premium and Indemnity for 65, 75, and 85 percent coverage

	Coverage (%)		
	65%	75%	85%
Liability	$1,711	$1,971	$2,242
Deductible	$921	$661	$390
Basic rate	0.0316		
Rate differential factor	1	1.661	2.596
Unit residual factor	1	1.129	1.198
Total premium	$53	$117	$221
Government subsidy percent	59%	55%	38%
Government subsidized amount	$31	$64	$84
Farmer premium	$22	$53	$137
Indemnity	$292	$552	$823