



# **Strengthening Risk Management Tools for Growers in South Florida: Crop Insurance Training**

## **Florida Avocado Crop Insurance Handbook**



**United States Department of Agriculture  
National Institute of Food and Agriculture**

## **Acknowledgements**

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## Introduction

This manual, developed by the Agricultural Economics Unit of the University of Florida, Tropical Research and Education Center, is intended to provide general guidelines about crop insurance for green skin avocado growers in South Florida. Specifically, the manual is aimed at simplifying the process, and increasing the understanding of growers, of how production risk might be mitigated by taking advantage of available federal crop insurance programs.

The manual is divided into three sections. Section 1 provides basic information about insurance eligibility and basic crop insurance concepts. Section 2 covers aspects related to how to obtain a crop insurance estimate using the United States Department of Agriculture, Risk Management Agency (USDA/RMA) online tool. Section 3 provides some exercises on how to calculate an indemnity using an Excel tool to simplify the indemnity calculation process. Additionally, the Excel tool will allow the grower to compare the financial results with and without crop insurance, based on simulated yield losses and coverage levels selected by the grower. By using this tool, the grower may be in a better position to make an informed decision on how to minimize the production risk.

We cannot guarantee the legal effect nor the appropriate use of the contents as individual results depend upon specific crop insurance policy details. Most of the information presented here was obtained from USDA/RMA and other industry sources.

***Note: Growers should consult with their crop insurance agents for a detailed crop insurance quote, and for more specific information about dates, specific conditions, and exclusions.***

## I. The Basics of Crop Insurance

### Background

Federal crop insurance was established in the 1930s, with multiple-peril crop insurance (MPCI) being the first crop insurance plan designed to cover yield losses from most natural causes. MPCI is better known as yield insurance or APH (Actual Production History) insurance. As is the case in other types of insurance, producers are able to select the coverage amount and structure of their crop insurance policy according to their needs. Loss payments (indemnities) are received when actual production (revenue) is below the yield (revenue) guaranteed as stated in the insurance policy. The federal government is directly involved with determining crop insurance policy provisions and rates.

### ***What Types of Losses Are Covered under Crop Insurance?***

- Adverse weather
- Earthquake
- Volcanic eruption
- Fire (due to natural causes)
- Wildlife
- Insects, but not damage due to insufficient or improper application of pest control measures
- Plant disease, but not damage due to insufficient or improper application of disease control measures
- Failure of the irrigation water supply if due to unavoidable causes

### ***Why Purchase Crop Insurance?***

Uncertainties about weather, yields, prices, government policies, global markets, and other factors make agriculture a risky business. Crop insurance is a risk management tool designed to mitigate the financial impact of adverse events; it may be the difference between financially surviving a bad year and leaving the industry.

### **Green Skin Avocado Insurance Eligibility**

All of your commercially grown avocado types are insurable if

- The actuarial documents provide premium rates
- They are grown for harvest as avocados
- They are grown on trees that have reached at least the fourth growing season after set out
- They are grown on acreage that has produced a minimum of 50 bushels of avocados per acre in 1 of the 3 previous crop years *and* you have a share in the crop
- They are grown in Miami-Dade County (the only county with this insurance product)

The causes of loss covered include:

- Adverse weather conditions;
- Earthquake;
- Fire;
- Volcanic eruption;
- Wildlife;
- Failure of irrigation water supply, if caused by an insured peril during the insurance year;  
or
- Insects or plant disease, but not damage due to insufficient or improper application of control measures.

### **Green Skin Avocado Insurance Definitions**

#### ***Bushel***

A unit of measure equal to 55 pounds of avocados

#### ***Early Variety***

232, Arue, Bassage, Bernecker, Beta, Biondo, Black Prince, Blair, Catalina, Christina, Collinson, Donnie, Dr. Dupuis, Fuchs, Gorham, Hardee, Hickson, K-5, K-9, Lisa, Loretta, Marcus, Miguel, Nadir, Nesbitt, Peterson, Pinelli, Pollock, Ruehle, Simmonds, Simpson, Tonnage, Tower 2, Trapp, and Waldin

#### ***Late Variety***

All other varieties not listed as an early variety

#### ***Important Dates (crop year example)***

- Sales Closing/Cancellation: November 30
- Acreage Reporting: January 15
- Premium Billing: August 15
- Termination: November 30

For actual crop year deadlines, please talk to your crop insurance agent, or check the USDA actuarial information browser at <http://webapp.rma.usda.gov/apps/actuarialinformationbrowser/>.

### **Price Election (PE)**

The value per bushel used to estimate the insurance premium and indemnity payment (if any) under the policy. The range of the price election (PE) is from 67 to 100 percent, by 1 percent increments. The latest information about price election can be found at the actuarial information browser (shown below).

To access the latest information on dates, and reference prices you may want to view the actuarial information browser at <http://webapp.rma.usda.gov/apps/actuarialinformationbrowser/>

Click on *AIB Reinsurance Year 2017* to get the information for that particular crop year. Then select from the drop-down menu as follows:

- Commodity: Avocados (0019)
- Commodity Year: 2017
- Insurance Plan: APH (90)
- State: Florida (12)
- County: Miami-Dade (086)

After selections have been made click on *View Report*; you will see a screen like this:

The screenshot shows the USDA Risk Management Agency's Actuarial Information Browser (AIB) interface. The page title is "AIB 2017" and the breadcrumb trail is "Information Browser > AIB 2017 > Crop > Commodity Report". The "Commodity Report" section displays the following selection criteria:

- 1 Commodity: Avocados (0019)
- 2 Commodity Year: 2017
- 3 Insurance Plan: APH (90)
- 4 State: Florida (12)
- County: Miami - Dade (086)

The "Prices" tab is selected, showing the "Prices - Base County" table. The table displays the established price for early, non-organic varieties at \$17.5000 per bushel.

Types / Practices	T/P 1	T/P 2	T/P 3	T/P 4	T/P 5	T/P 6
<b>Type</b>	Early Varieties 056	Late Varieties 057	Early Varieties 056	Late Varieties 057	Early Varieties 056	Late Varieties 057
<b>Practice</b>	Non-Irrigated 003	Non-Irrigated 003	Organic(Certified) Non-Irr. 713	Organic(Certified) Non-Irr. 713	Organic(Transitional) Non-Irr. 714	Organic(Transitional) Non-Irr. 714
<b>Prices - Base County</b>						
Established Price	\$17.5000	\$17.5000	\$26.2500	\$26.2500	\$17.5000	\$17.5000
Catastrophic Price	\$9.6300	\$9.6300	\$14.4400	\$14.4400	\$9.6300	\$9.6300
Maximum Contract Price Factor			2.0000	2.0000	2.0000	2.0000
Maximum Contract Price			\$52.5000	\$52.5000	\$35.0000	\$35.0000
Contract Price Code			Yes	Yes	Yes	Yes

To get the relevant info for the crop year, you just need to click on the respective tab. On the screen above, the prices tab has been selected; it shows that the established price for early, non-organic varieties is \$17.5/bushel (Prices – Base County).

## **Basic Crop Insurance Concepts**

### ***Crop Insurance Coverage***

Grower's Actual Production History (APH) determines yield guarantee and premium rate. To establish APH, growers should keep at hand/available 4 to 10 years of historical yields of the unit to be insured.

If a grower lacks 4 years of yield records, and wants to get crop insurance, then a Transitional or T-Yield may be used to estimate yield. The T-Yield is based on the county's 10-year average as determined by the United States Department of Agriculture, National Agricultural Statistics Service (USDA/NASS).

In the case where the grower has no records and has grown the crop in the county, an APH yield equal to 65 percent of the T-Yield is assigned. If the grower has one year of records, a yield equal to 80 percent of the T-Yield is used for the three missing years. If two years of records are available, then a 90 percent T-Yield is used for the two missing years. When three years of yield records are available, then the APH is determined by averaging the T-Yield based on the three years of actual yield.

There is an exception for growers with no yield records, whereby a new grower who has not produced the crop in the county for more than two years is assigned 100 percent of the T-Yield.

The 2014 U.S. Farm Bill added a new provision that allows for the exclusion of an actual yield (APH Yield Exclusion [YE]) for a crop year when the USDA/RMA determines the county per planted acre yield for a crop was at least 50 percent below the simple average of the per planted acre yield for the crop for the previous 10 consecutive crop years.

The approved yield is the APH history yields, assigned or adjusted yields, or T-Yields calculated by the insurer. For avocados, the latest APH crop year reported is determined by subtracting 2 years from the present crop year. For example, in determining the approved APH for the 2016 crop year, at least the last four production reports through the 2014 production year are required (4-year minimum reports).

Catastrophic Risk Protection (CAT) is the most basic insurance policy; it is a fixed coverage product. It covers 50 percent of your approved yield and 55 percent of the price election. CAT is 100 percent subsidized with no premium paid by the grower. There is an administrative fee of \$300 per crop per county which the grower must pay in order to be eligible, regardless of the acreage.

Any coverage above CAT is considered buy-up coverage. It ranges from 50 to 75 percent (80 and 85 percent in some crop insurance policies) in 5 percent increments. For green skin avocados, the approved APH yield is covered. If your approved APH yield is 200 bushels/acre (bu/A) and you elect a 75 percent coverage level, then the insured yield (yield guarantee) is 150 bu/A.

### ***Insurance Premium***

The premium is the cost paid by the grower for crop insurance protection; premiums are set by USDA. Premium amount depends on the desired coverage level (usually from 50 to 75 percent), and price election percentages (fixed in some policies). To encourage crop insurance adoption, a percentage of the premium is subsidized by the federal government. For the crop year 2017, the crop insurance premium is due on August 15 or when an indemnity payment is received, whichever comes first.

Table 1 shows premium subsidy and producer's share based on specific coverage levels. Producer's premium share increases when a higher coverage level is selected, while premium subsidies decrease with a higher coverage level. For example, if you select the 75-percent coverage level, your premium share is 45 percent of the base premium.

**Table 1.** Crop insurance premium subsidies and producer premiums based on coverage level

Item	Coverage Level					
	50	55	60	65	70	75
Premium Subsidy	67	64	64	59	59	55
Your Premium Share	33	36	36	41	41	45

### ***Insurance Deductible***

It is the loss limit that you as a crop insurance policy holder must absorb before benefits from the insurance policy are paid; in other words, the insurer generally pays all the losses beyond the deductible. Crop insurance deductibles range from 25 to 50 percent in 5 percent increments (15 and 20 percent deductibles are available in some insurance products).

### ***Insurance Unit***

The type of unit to be insured also determines crop insurance premiums. There are four unit types available for crop insurance policies: basic, optional, enterprise, and whole-farm.

- *Basic unit*: this type of unit, determined by ownership of the commodity, cash rents, and owned land, is considered one basic unit.
- *Optional unit*: this type of unit is subdivided basic units (irrigated/non irrigated, by section), and it allows insurance to be customized according to risk management needs. Insurance premiums for optional units carry a surcharge, and are available only for coverage levels above CAT.
- *Enterprise unit*: this type of unit includes all shares of the crop in the county which aggregates sharecropped land with owned and rented land.
- *Whole-farm unit*: this type of unit is available only on certain revenue insurance policies; it allows aggregation of all eligible insured crops grown in the county.

### ***Insurance Indemnity***

Technically, a loss occurs when the actual yield (revenue) is below the yield (revenue) guarantee as stated in the crop insurance policy. After experiencing a loss, usually the grower receives a net indemnity (the calculated value of the indemnity minus grower's insurance premium).

For additional information on reporting requirements and duties in the event of damage or loss, please visit [http://www.rma.usda.gov/fields/ga\\_rso/2016/2016flavocado.pdf](http://www.rma.usda.gov/fields/ga_rso/2016/2016flavocado.pdf) or consult an insurance crop agent.

## **II. Crop Insurance Premium Estimator**

A grower interested in obtaining a crop insurance quote for his operation may use the USDA/RMA website's online insurance premium calculator for that purpose. ***Please keep in mind that your actual premium will depend upon your specific conditions and exclusions; refer to your crop insurance agent for more details.***

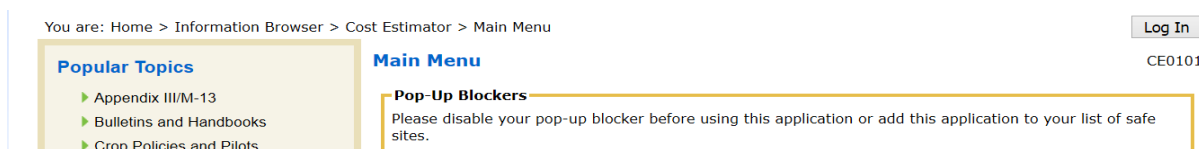
Below are two exercises showing how to obtain an online crop insurance premium quote for crop year 2017 at the USDA/RMA website. In the first scenario, it is assumed that the grower produces early



variety avocados, does not have an irrigation system in place, selects the 100 percent price election (\$17.50/bu for crop year 2017), has a crop area of 10 acres in full production, has an APH yield of 200 bu/A, and has 100 percent interest in the crop (i.e., the grower is not sharecropping).

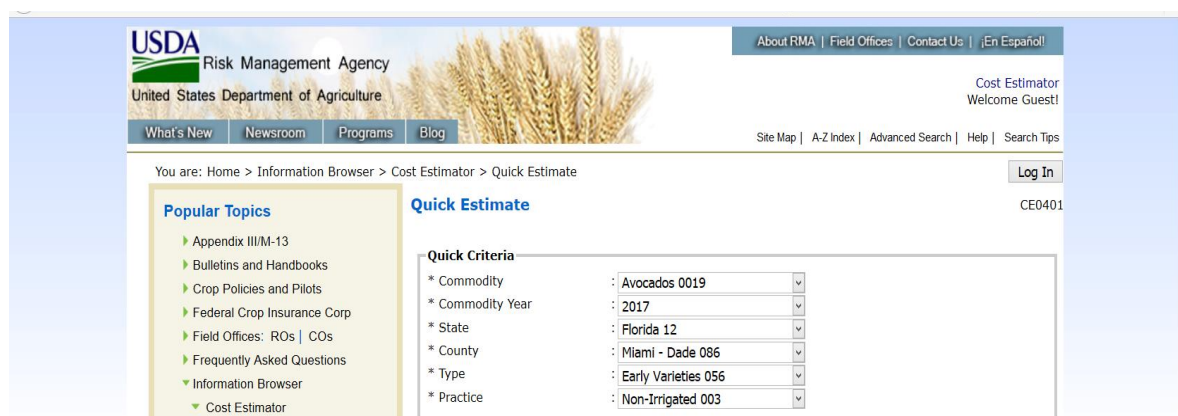
**Step 1:** Open the cost estimator at <https://ewebapp.rma.usda.gov/apps/costestimator/Default.aspx>

*After loading the web page, please disable your pop-up blocker (see website message example below)*



After the pop-up blocker has been disabled, click on the *Quick Estimate* link. Then choose the *Quick Criteria* box, and select the following options using the drop-down menu:

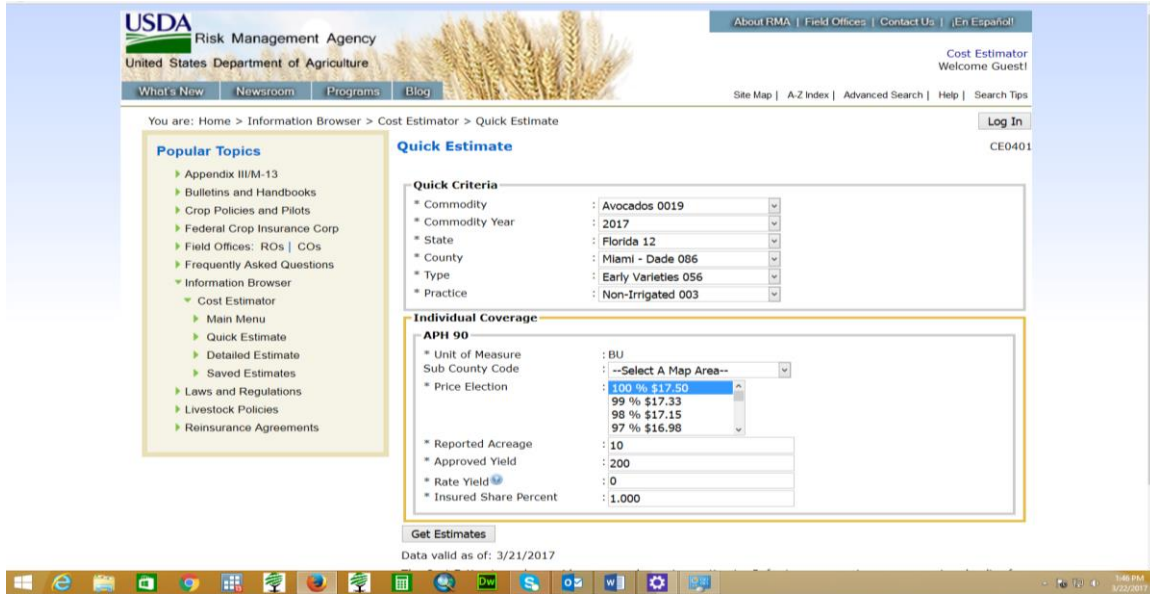
- Commodity: Avocados 0019
- Commodity Year: 2017
- State: Florida 12
- County: Miami-Dade 086
- Type: Early Varieties 056
- Practice: Non-Irrigated 003



**Step 2:** Farther down the screen, choose the *Individual Coverage* box and select:

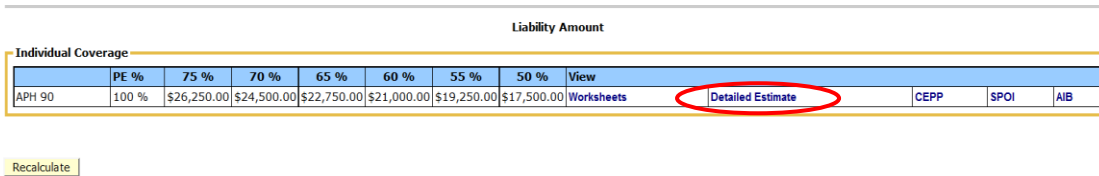
- Price Election: 100% \$17.50
- Reported Acreage: 10
- Approved Yield: 200
- Insured Share Percent: 1.000

The screen with the selected parameters will look like this:

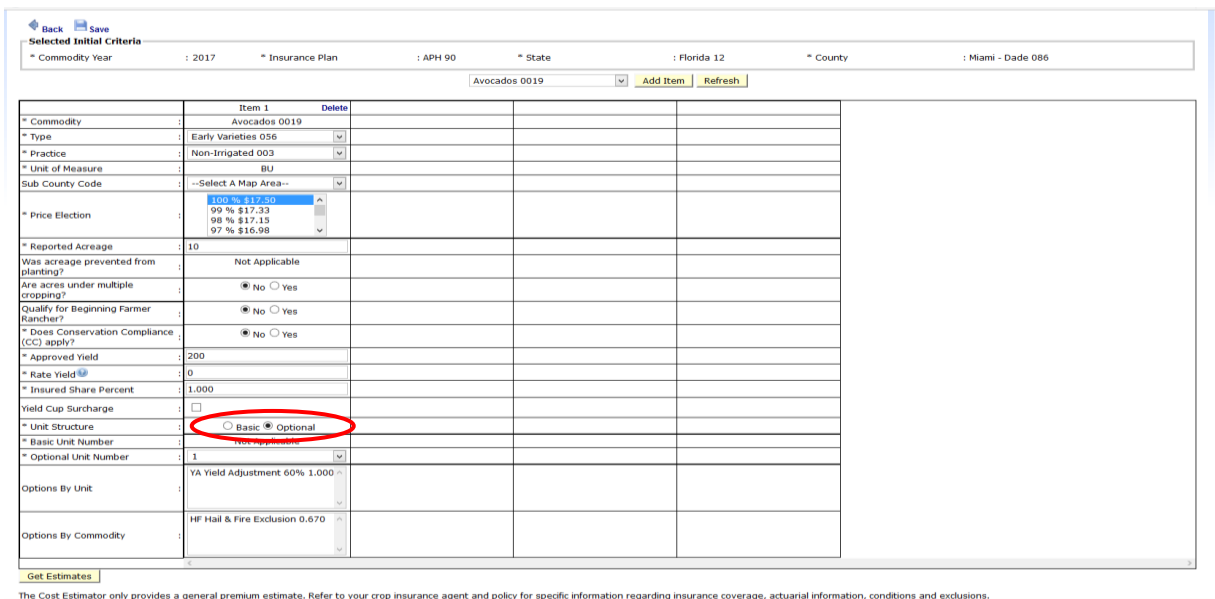


Click on the *Get Estimates* link (at bottom of screen above)

**Step 3:** Find the *Individual Coverage* box, and click on *Detailed Estimate*




You will now see the following screen:



**Step 4:** In the screen above, under *Yield Cup Surcharge*, change *Unit Structure* from *Optional* to *Basic*, and click *Get Estimates* (at bottom of screen above).

On the next screen, select *Producer Premium Amount* to obtain the following *Detailed Estimate*:


Cost Estimator  
Welcome Guest!

---

**Detailed Estimate 463815**

Back Save Print/Export

**Selected Initial Criteria**

* Commodity Year : 2017	* Insurance Plan : APH 90	* State : Florida 12
* County : Miami - Dade 086		

**Show Inputs In Grid**

<< Show Available Inputs >>

**Show Results In Grid**

Liability Amount
  Total Premium Amount
  **Producer Premium Amount**
 Subsidy Amount
  Loss Trigger Point

Producer Premium Amount

Avocados 0019	PE %	75 %	70 %	65 %	60 %	55 %	50 %	CAT 50 %	View
Item 1	100 %	\$601.00	\$408.00	\$298.00	\$201.00	\$152.00	\$105.00	-	Worksheets
	55 %	-	-	-	-	-	-	\$0.00	CEPP SPOI AIB

The Cost Estimator only provides a general premium estimate. Refer to your crop insurance agent and policy for specific information regarding insurance coverage, actuarial information, conditions and exclusions.

The exercise above shows the producer's insurance premium (early variety avocados, 10-acre farm, APH yield of 200 bu/A, and 100% price election) under different coverage levels ranging from 50 to 75 percent. If the grower selects the maximum 75 percent coverage level (150 bu/A insured yield), the total insurance premium for a 10-acre farm is \$601 (\$60.1/acre). Likewise, if the grower selects the minimum 50 percent coverage level (100 bu/A insured yield), the insurance premium is \$105.2 (\$10.5/acre). Also, this exercise shows that with CAT insurance, there is no producer premium. To purchase this insurance product, the grower will pay a \$300 fee independent of the acreage. It is important to remember that CAT insures only 50 percent of your approved APH, and has a fixed 55 percent price election (100 bu/A and \$9.63/bu for the present exercise). ***The insurance premiums in the exercise above are only for an approved APH yield of 200 bu/A. If your approved yield is higher (lower), then the associated premiums will be higher (lower). Crop insurance premiums are specific to the respective yield levels.***

Now let us look at the second exercise. In this scenario, it is assumed the grower owns 10 acres of late variety avocados in full production grown on a basic unit, does not have any irrigation system in place, selects a 95 percent price election (\$16.63/bu for crop year 2017), has an APH yield of 250 bu/A, and has a 100 percent interest in the crop (i.e., not sharecropping). Using the USDA/RMA cost estimator website, we explore two different levels of insurance coverage. What would be the producer insurance premium for crop year 2017, assuming a coverage of 70 percent? What would be the producer insurance premium if the coverage were 60 percent?

The input for the *Quick Estimate* box will look like this

As shown in the screen below, if you select 70 percent coverage level and 95 percent price election, your premium is \$520 (\$52/acre). If you select 60 percent coverage level and 95 percent price election, your premium is \$257 (\$25.7/acre).

Avocados 0019	PE %	75 %	70 %	65 %	60 %	55 %	CAT 50 %	View
Item 1	95 %	\$765.00	\$520.00	\$380.00	\$257.00	\$195.00	-	Worksheets
	55 %	-	-	-	-	-	\$0.00	CEPP SPOI AIB

The Cost Estimator only provides a general premium estimate. Refer to your crop insurance agent and policy for specific information regarding insurance coverage, actuarial information, conditions and exclusions.

### III. Estimating Indemnity Payments

#### Calculating Indemnities

As defined earlier, indemnities (insurance payouts) are received only if the actual yield is less than the yield guarantee. If the actual yield is equal to the yield guarantee, there is no indemnity payment to the insured grower.

For the purpose of illustrating how an indemnity payment is estimated, we continue with our previous premium estimation exercises. Let us assume the grower anticipates an active hurricane season and purchases crop insurance based on an approved APH yield of 200 bu/A. With a 75 percent coverage level and 100 percent price election, yield guarantee is 150 bu/A, and price election is \$17.5/ bu. If there is bad weather during the crop season, the actual avocado yield will be 120 bu/A, not 200 bu/A. If actual yield is below (30 bu/A lower) the yield guarantee, the grower is eligible to receive an indemnity payment. The indemnity is calculated as follows based on a 75 percent coverage level:

**Step (1):** Determine the yield guarantee

$$\begin{aligned} & \text{APH yield} * \text{coverage level} \\ & 200 \text{ bu/A} * 0.75 = 150 \text{ bu/A} \end{aligned}$$

**Step (2):** Determine the yield lost by subtracting the actual yield from the yield guarantee

$$150 \text{ bu/A} - 120 \text{ bu/A} = 30 \text{ bu/A}$$

**Step (3):** If the amount in Step 2 is positive, multiply the yield lost by the PE, and then subtract the insurance premium

$$\begin{aligned} & (30 \text{ bu/A} * 17.50 \text{ bu}) - \$ 60.1/\text{acre} = \$ 464.9 \text{ net indemnity per acre} \\ & (\$4,649 \text{ total net indemnity}) \end{aligned}$$

Up to this point, the grower is covering part of the losses, but what will happen to the net profitability at the end of the crop year? What would be the situation had the grower not purchased crop insurance? These questions will be answered in the next section.

#### Using an Avocado Crop Insurance Excel Case Study

Should you decide to purchase avocado crop insurance, you do not have to go through the calculations shown above each time you want to examine potential losses covered by crop insurance. Rather, you can use Excel file [avocado-APH.xlsx](#) (available at <http://agecon.centers.ufl.edu/cropins.html>) to calculate indemnities and to simulate net profitability with crop insurance (APH 90 & CAT) and without crop insurance under several coverage levels, price elections, and yield scenarios. After you download and open the Excel file [avocado-APH.xlsx](#), go to the APH 200 spreadsheet. To keep it simple, we continue to work with the previous exercise. The first step is to select the coverage level and price election. Table 2 shows producer insurance premiums per acre for different coverage levels and price elections (premiums in Table 2 are specific to an APH yield of 200 bu/A). For a scenario of high risk-aversion, 75 percent coverage level, and 100 percent price election (see highlighted cells), the insurance premium is \$60.1/acre.

**Table 2.** Producer premium amount under different price elections and coverage levels

Price Election		Coverage Level						
%	\$/bushel	75%	70%	65%	60%	55%	50%	CAT
100	17.50	60.1	40.8	29.8	20.1	15.2	10.5	N/A
95	16.63	57.1	38.8	28.3	19.1	14.4	N/A	N/A
90	15.75	54.1	36.7	26.8	18.1	N/A	N/A	N/A
85	14.88	51.1	34.7	25.3	17.1	N/A	N/A	N/A
80	14.00	48.1	32.6	23.8	N/A	N/A	N/A	N/A
55	9.63	N/A	N/A	N/A	N/A	N/A	N/A	300

The next step is to select the size of the area to insure, and to calculate yield guarantee and insured value based on the coverage and price election selected above. Table 3 shows the parameters needed to calculate the yield guarantee per insured unit (green cells), and the insured value (based on the P.E.), the insurance premium for the area to be insured, and the CAT insured value and insured yield (blue cells). At the bottom of Table 3, the user may enter an actual or simulated yield on the cell called *Grower Actual Yield* (orange cells) to calculate indemnity payments (if any), and to evaluate the impact of a catastrophic event on the user's net profits.

**Table 3.** Parameters to calculate net indemnity, and profitability with and without insurance

<b>Net Indemnity, and Profitability Estimator with APH 90 &amp; CAT Avocado Insurance</b>	
APH Yield (bushels/acre)	<b>200</b>
Area insured (acres)	<b>10</b>
Coverage level (%)	<b>75%</b>
Price election (%)	<b>100</b>
Price election (\$)	17.50
Yield guarantee (bu/unit)	1,500
Insured value (\$/unit)	26,250
Premium (\$/acre)	60.1
Premium (\$/unit)	601
CAT yield guarantee (bu/unit)	1,000
CAT insurance value (\$/unit)	9,630
CAT insurance premium (\$/unit)	300
Grower actual yield (bu/acre)	<b>120</b>

Continuing with our exercise, Table 3 shows that with 75 percent coverage and 100 percent price election, the yield guarantee is 1,500 bushels/insured unit (150 bu/A), with an insured value of \$26,250 (\$262.5/acre) under the APH 90 policy. If the CAT crop insurance is elected, then the yield guarantee, is 1,000 bushels/insured unit (100 bu/A), with an insured value of \$9,630 (\$963/acre). Note that because of an active hurricane season, the grower in our exercise had a yield of 120 bu/A—with this information, we can calculate the net indemnity, and then the net profit with and without crop insurance.

**Table 4.** Net indemnity payments under several actual yield scenarios

<b>Yield Bu/A</b>	<b>Net Indemnity \$/unit</b>
<b>300</b>	-601.0
<b>275</b>	-601.0
<b>250</b>	-601.0
<b>225</b>	-601.0
<b>200</b>	-601.0
<b>175</b>	-601.0
<b>150</b>	-601.0
<b>125</b>	3774.0
<b>Grower 120</b>	4649.0
<b>CAT 120</b>	-300.0

Table 4 shows net indemnity payments covering a range of yield options. In this scenario, because the yield guarantee in this case is 150 bu/A (green cell), yields at or above the yield guarantee are ineligible to receive an indemnity payment. The negative value of \$601 from yields in the 150 to 300 bu/A range shows a premium is paid to insure the farm, but no indemnity is paid to the grower because there are no losses. An insured grower receives an indemnity for yields below the yield guarantee. For example, if the actual yield is 125 bu/A, the grower will receive an indemnity of \$3,774. In our exercise, an actual yield of 120 bu/A (orange cell) results in an indemnity payment of \$4,649 (\$464.9/acre).

### Assessing the Financial Benefit of Crop Insurance

The grower in the exercise receives an indemnity payment, but this situation raises questions: (1) How did the catastrophic event affect the grower's net profit after being compensated by the losses incurred, and (2) What would be the situation had the grower not purchased crop insurance? To illustrate this, we continue our analysis with the assumption of a production cost of \$26,184 for a 120 bu/A yield.

Table 5 illustrates the projected net profits without the APH 90 and CAT crop insurance policy. To calculate net profits, we use the average production costs associated with each yield level. The Excel tool is flexible and allows users to use their own production costs. As shown in Table 5, there is a profit as long as yields are above 175 bu/A and the price received is \$16.63/bu/A or more. Taking a closer look at Table 5 reveals the financial risk to the grower due to falling yields and prices. Losses may be substantial when actual yields and prices are below the yield guarantee and the price election, respectively. For example, in a scenario where the yield is 120 bu/A, and the price is \$17.5/bu, and the grower has no crop insurance, the grower will realize a net loss of \$5,184 for the crop year. If the commodity price drops 10 percent to \$15.75/bu/A, the net loss is \$7,284, or 40 percent greater than the base case.



**Table 5.** Net profits without insurance (\$/unit)

		(\$/bushel)				
		<b>15.75</b>	<b>16.625</b>	<b>17.5</b>	<b>18.375</b>	<b>19.25</b>
		(-10%)	(-5%)	base	(+5%)	(+10%)
	<b>300</b>	14,730	17,355	19,980	22,605	25,230
	<b>275</b>	11,673	14,079	16,485	18,891	21,298
	<b>250</b>	8,615	10,803	12,990	15,178	17,365
	<b>225</b>	5,558	7,526	9,495	11,464	13,433
	<b>200</b>	2,500	4,250	6,000	7,750	9,500
	<b>175</b>	(558)	974	2,505	4,036	5,568
	<b>150</b>	(3,615)	(2,303)	(990)	323	1,635
	<b>125</b>	(6,673)	(5,579)	(4,485)	(3,391)	(2,298)
<b>Grower</b>	<b>120</b>	(7,284)	(6,234)	(5,184)	(4,134)	(3,084)
	<b>120</b>	(7,284)	(6,234)	(5,184)	(4,134)	(3,084)

Table 6 illustrates the expected profits when APH 90 and CAT insurance are part of the financial risk management of the farm. Examining Table 6 shows that the risk protection provided by the APH 90 insurance comes at the cost of obtaining lower profits when yield is above the guaranteed yield level. Although APH 90 insurance provides protection against falling yields, it provides protection against prices falling below the election level price only when yields fall below the yield guarantee.

**Table 6.** Net profits with APH 90 & CAT insurance (\$/unit)

		(\$/bushel)				
		<b>15.75</b>	<b>16.625</b>	<b>17.5</b>	<b>18.375</b>	<b>19.25</b>
		(-10%)	(-5%)	base	(+5%)	(+10%)
	<b>300</b>	14,129	16,754	19,379	22,004	24,629
	<b>275</b>	11,072	13,478	15,884	18,290	20,697
	<b>250</b>	8,014	10,202	12,389	14,577	16,764
	<b>225</b>	4,957	6,925	8,894	10,863	12,832
	<b>200</b>	1,899	3,649	5,399	7,149	8,899
	<b>175</b>	(1,159)	373	1,904	3,435	4,967
	<b>150</b>	(4,216)	2,904	(1,591)	(279)	1,034
	<b>125</b>	(2,899)	(1,805)	(711)	383	1,477
<b>Grower</b>	<b>120</b>	(2,635)	(1,585)	(535)	515	1,565
<b>CAT</b>	<b>120</b>	(7,584)	(6,534)	(5,484)	(4,434)	(3,384)

In the base case (120 bu/A, \$17.5 /bu) scenario with crop insurance, the grower will incur a net loss of \$535 (\$53.5/acre), a loss 10 times smaller compared to the case of no insurance (\$535 vs \$5,184). If we change the scenario where the yield is still 120 bu/A, but now the price received by the grower drops to \$15.75/bu/A (a 10% decrease of the base price), there will be no change in the indemnity received if the grower has APH 90 insurance (independent of changes in market prices, indemnities will be calculated using the price election of the insurance policy).



In the scenario where the grower purchases CAT insurance, an indemnity will be paid only when the actual yield is below the CAT yield guarantee (50% of the approved yield). In our exercise, benefits will be received if the actual yield is below 100 bu/A. Given that CAT insurance comes with a fixed price election of 55%, benefits received will be much lower compared to the APH 90 insurance.

### **Concluding Remarks**

In summary, crop insurance should be viewed as a financial risk management tool to protect you from catastrophic events. It should not be viewed as supplemental income or as a potential source of income. Having crop insurance may be the difference between surviving a bad year and going out of business. While an indemnity payment helps minimize losses significantly, there will still be losses, although much smaller compared to the case of no crop insurance at all.

The decision to obtain crop insurance involves certain tradeoffs related to coverage level, insurance guarantee, and its associated costs. This issue is even more complex when considering the extra cost of additional protection for a specific commodity. In the end, it depends on risk tolerance, short-term expectations, and the availability of financial resources to stay afloat if a catastrophic event occurs.

### **References**

- USDA/RMA. (2016). *Avocado Fruit Florida Fact Sheet*. Retrieved from [http://www.rma.usda.gov/fields/ga\\_rso/2017/2017flavocado.pdf](http://www.rma.usda.gov/fields/ga_rso/2017/2017flavocado.pdf)
- USDA/RMA (2010). *Florida Avocado Crop Provisions*. Retrieved from <http://www.rma.usda.gov/policies/2011/11-0019a.pdf>