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Release of *iFarm Premium Calculator* and *iFarm Payment Evaluator*

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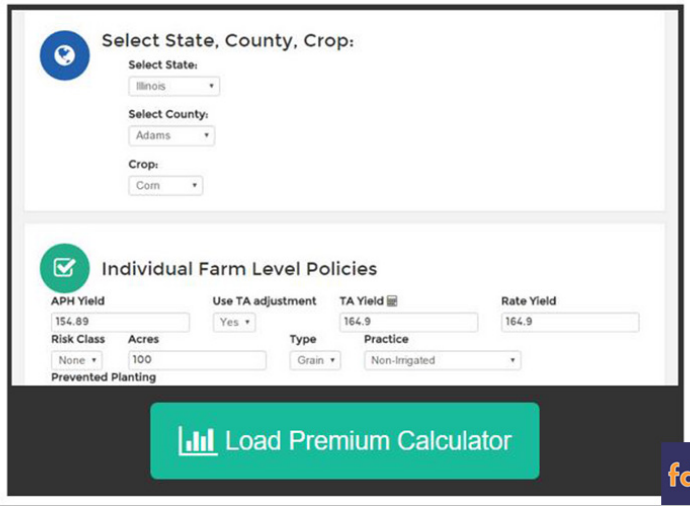
Two new web-based decision tools are now available in the crop insurance section of *farmdoc*. The *ifarm Premium Calculator* provides farmer-paid premiums for insurance products on a per acre basis. The *ifarm Insurance Evaluator* provides performance evaluations of alternative crop insurance products for a case farm within a county. These computer tools are supported by the National Center for Supercomputing Applications (NCSA) at the University of Illinois. Evaluations of crop insurance are available for corn and soybeans in the Midwest, Great Plains, and eastern United States. The web-based design of these products are scalable to different platforms including laptop computers, tablets, and phones.

ifarm Premium Calculator

The *ifarm Premium Calculator* can be accessed from the "Load Premium Calculator" button in the crop insurance section in *farmdoc* (see Figure 1).

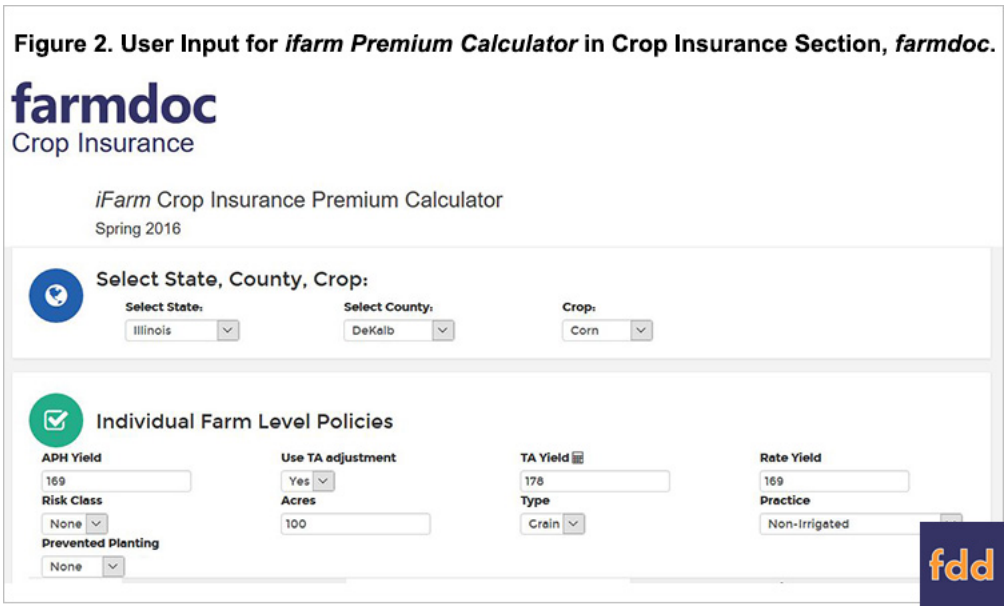
Figure 1. Screen for *ifarm Premium Calculator* in Crop Insurance Section, *farmdoc*.



Once loaded, users can choose the state, county, and crop for which they wish a premium estimate (see Figure 2). In the following example, the quote is for corn grown in DeKalb County, Illinois. The user can change various inputs that will influence COMBO product premium:

1. APH (Actual Production History) Yield – The yield without Trend-Adjustment of Yield Exclusion.
2. USE TA adjustment – Indicates whether the trend-adjustment endorsement will be taken.
3. TA Yield – The yield after trend adjustments and yield endorsements.
4. Rate yield – The average yield, usually equal to the APH yield.
5. Risk Class – Choices of high risk farmland will be given in counties with high-risk farmland.
6. Acres – acres in the unit.
7. Type – Varies by crop with the usual type given as a default.
8. Practice – Varies by crop with the usual practice given as a default.
9. Prevented Planting – choice of the usual prevented planting of 5% and 10% buy-ups.

Figure 2. User Input for *ifarm Premium Calculator* in Crop Insurance Section, *farmdoc*.



Based on these inputs, the use will get a series of farmer-paid premiums stated on a per acre basis (See Figure 3). These premiums will be given for:

1. Revenue Protection (RP) – a revenue product with a guarantee increase, the most used crop insurance policy for grain crops in the Midwest.
2. Revenue Protection with the Harvest Price Exclusion – a revenue product without a guarantee increase.
3. Yield Protection (YP) – a yield insurance.

Figure 3. Premiums from *iFarm Premium Calculator*.

	Revenue Protection				Revenue Protection With Harvest Price Exclusion				Yield Protection			
Coverage Level	Enterprise	Basic	Optional	Minimum Revenue Guarantee	Enterprise	Basic	Optional	Revenue Guarantee	Enterprise	Basic	Optional	Yield Guarantee (Bu/Acre)
50%	0.53	0.92	1.32	369	0.4	0.71	0.99	369	0.43	0.72	1.06	89
55%	0.75	1.51	2.07	406	0.47	1.03	1.34	406	0.61	1.09	1.53	98
60%	1.05	2.29	2.94	443	0.53	1.35	1.73	443	0.86	1.55	2.08	107
65%	1.49	3.81	4.7	480	0.66	2.12	2.71	480	1.22	2.49	3.2	116
70%	2.37	5.88	6.9	517	1.07	3.23	3.78	517	1.71	3.51	4.29	125
75%	4.01	9.21	10.35	554	1.76	4.8	5.36	554	2.5	4.89	5.73	134
80%	7.98	14.94	16.14	591	3.57	7.77	8.33	591	4.48	7.27	8.21	142
85%	16.87	25.29	26.33	628	7.84	13.38	13.76	628	8.61	11.35	12.26	151

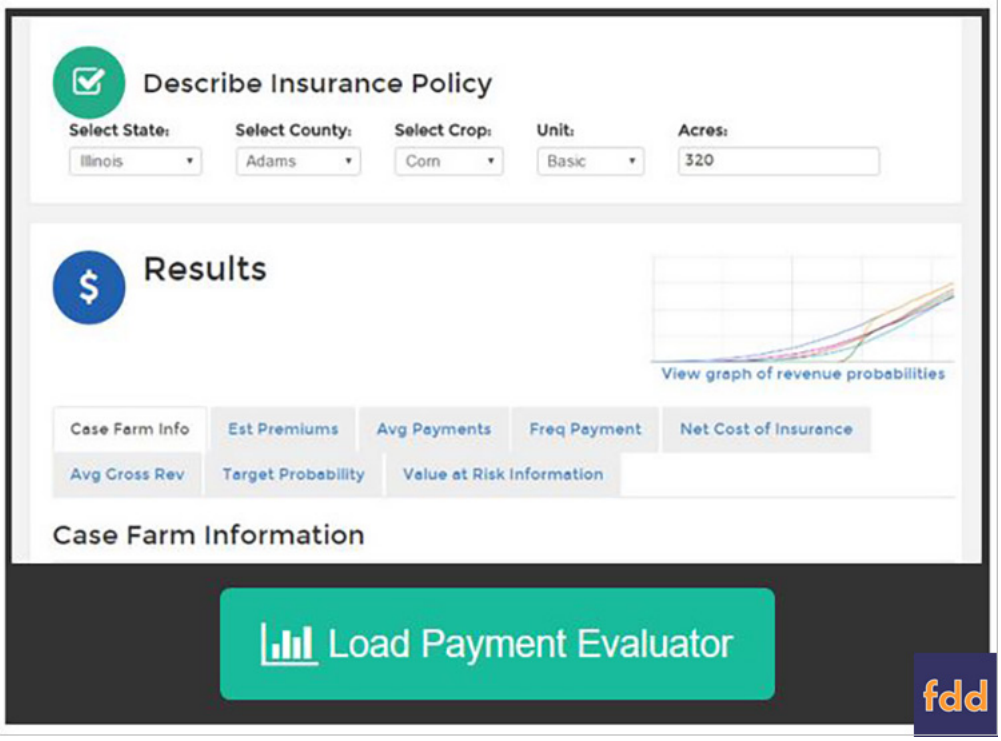
Projected Price: $4.15 | Volatility Factor 0.2 | Price and Volatility data as of Feb 1, 2016 | fdd

The *iFarm Premium Calculator* also gives quotes for the Area Risk Protection Insurance (ARPI) which are based on county yields. These include plans for rea Revenue Protection (ARP), ARP with Harvest Price Exclusion (ARP-HPE), and Area Yield Protection (ARP).

iFarm Payment Evaluator

The *iFarm Payment Evaluator* is available through the "Load Payment Evaluator" button in the following screen in the crop insurance section of farmdoc (see Figure 4).

Figure 4. Screen for *ifarm Premium Calculator* in Crop Insurance Section, *farmdoc*.



Users will select a 1) state, 2) county, 3) crop, 4) enterprise unit, and 5) acres in the unit. The *iFarm Payment Evaluato*r then shows results for a typical farm in that county. These typical farms have yields representative of the county. Figure 5 shows an example for corn in DeKalb County with an enterprise unit (320 acres). This farm has an average yield of 183.40 bushels per acre. If we could repeat 2016 a large number of times, the average yields for 2016 would be close to 183.4 bushels per acre. There will be variability around this yield: 30% of the time the yield will be below 172.79 bushels per acre, 20% of the itme yield will be below 164.07 bushels per acre, 10% of the time yield will be below 151.03 bushels per acre, and 5% of the time the yield will be below 139.50 bushels per acre (see Figure 5).

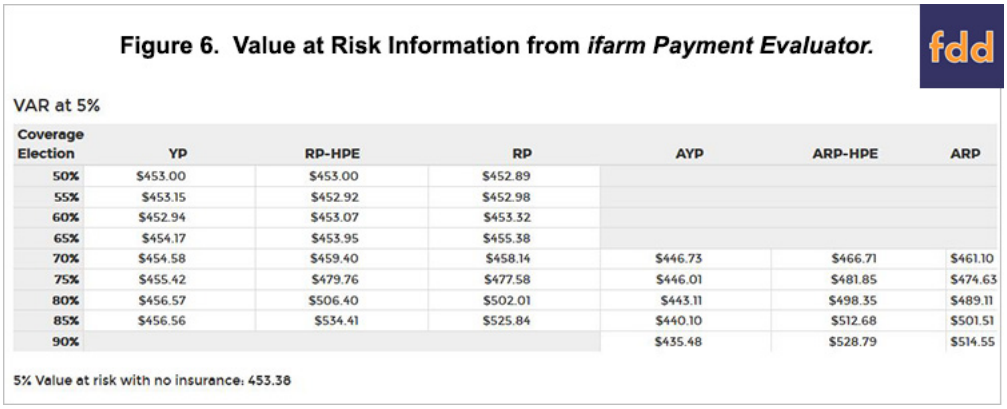
For this example farm, the user can get a variety of results for the example farm as is indicated on the tabs of the output box (See Figure 5):

- Est Premiums – Farmer-paid premiums for RP, RP-HPE, YP, ARYP, ARP-HPE, and ARP at different coverage levels.
- Average payments – Average payments from insurance.
- Frequency payment – The percent of time crop insurance will likely make payments.
- Net costs of insurance – Farmer-paid premium minus average payments. This table gives a feel of the costs of insurance after considering payments from crop insurance
- Average Gross Rev – shows the average gross revenue. This value equals crop revenue plus crop insurance payments minus crop insurance premium.
- Target Probability – The chance of meeting a target revenue with various levels of crop insurance.
- Value at Risk Information – Shows the impacts of crop insurance on downside risk.

The Value at Risk (VAR) output is particularly useful in evaluating the impacts of crop insurance on downside risk. In the *iFarm Payment Evaluator*, the downside risks are calculated on gross revenue which includes crop revenue plus insurance payments minus insurance premiums. Figure 6 shows a VAR at 5% for the DeKalb County farm. A 5% VAR means that 5% of the time revenue will be less than the indicated number.

Figure 5. Case Farm Information from the *ifarm Payment Evaluator*.

Figure 6. Value at Risk Information from *ifarm Payment Evaluator*.



In the example case, the 5% VAR with no insurance is $453.38 (see bottom of Figure 6). If crop insurance reduces risks, the VARs should increase with insurance, meaning that the probability of low revenue is decreased. As can be seen, crop insurance reduces revenue particularly when high coverage levels and when revenue insurances are used. At an 85% coverage level, RP-HPE increases the 5% VAR to $534.41 and RP increases it to $525.84. Both of these increases are substantial compared to the case without insurance.

The results shown in Figure 6 for the DeKalb County farm are fairly similar to most case farms:

- Revenue insurance (RP, RP-HPE, ARP-HPE, and ARP) reduce downside revenue risks more than yield insurance (YP and AYP)
- Downside revenue risks are decreased more as coverage level increases

These two factors explain the high use of revenue insurances *farmdoc daily*, Janaury 20th.

For the DeKalb County case, ARP and ARP-HPE at a 90% coverage level increase 5% VARs as much as RP-HPE and RP at the 85% coverage level: $528.79 and $514.55 VARs for ARP-HPE and ARP as

compared to $434.41 and $525.84 for RP-HPE and RP. This result will vary across counties. Also, the area products (ARP-HPE and ARP) do not increase 1% VARs as much as farm-level product (RP-HPE and RP), meaning that very low levels of revenue are not reduced as much by county products as by farm products. Those 1% VARs are provided in the *iFarm Payment Evaluator.*

Summary

These two new tools will aid farmers in making crop insurance decisions. As February continues, results in these tools will be updated to reflect more precise levels of projected prices and volatilities. While these values will change, these changes will not change relative performance of crop insurance products. Projected prices and volatilities will be known for certain at the end of February.

In 2015, many farmers took either RP or ARP at a high coverage level. Results from the *iFarm Payment Evaluator* indicate that this is a very good choice for providing risk protection (*farmdoc daily*, Janaury 20, 2016). Existence of new farm commodity programs do not change this choice (*farmdoc daily*, January 26, 2016).

References

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