Understanding Use-Value Estimates for Northampton and Accomack Counties

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Introduction

Estimates of use-value assessment values for primarily cash grain and oil seed counties have been "high" relative to current market price and lower net returns. This paper uses Accomack and Northampton counties as examples to explain the process for estimating annual use-value assessment and the underlying reasons that estimates have not tracked with current prices and net returns.

To arrive at the published use-value assessments values requires using published data and sequential steps that include: agricultural census data, composite farm acres and weighting calculations, crop net returns and Olympic averaging, federal payment data and Olympic averaging, data for capitalization rates and the capitalization process, and soil index adjustments. Each of these will be briefly explained (for details see Procedures Manual at http://www.usevalue.agecon.vt.edu/myweb3/Procedures/Methods%20and%20Procedures%20TY2015%20(11-13-15).pdf .

Tax Year vs Data Year

> *An important distinction to understand when viewing estimates of use-value assessments is what is meant by tax year (TY), data year (DY) and calendar year (CY). Data used for calculating estimates lag 2 DY's from the identified TY. For example, estimates for TY2016, are released by SLEAC in September 2015 calendar year (CY). These values are based on data published by the National Ag Statistics Service (NASS) and other agencies after the 2014 cropping season. Thus, TY2016 corresponds to DY2014.*

Agriculture Census

The 2012 Census of Agriculture provides county-level crop acreage and number of farms for a county. It is the starting point for all use-value calculations. Specifically, this data is used to weight estimated net returns for each crop (more details in the Composite Farm section).

Calculating Composite Farm acres and Weights

The composite farm (CF) within a county can be thought of as the average or representative farm for that county. The CF acreage for each county is calculated by dividing the number of individual crop acres reported in the 2012 Ag Census by the reported number of farms. If the calculated average acreage is greater than 0.5 acres, then the crop is included in the county's CF. All individual crop CF acreages are summed yielding the average farm size for that county. Dividing each CF crop acreage by the CF total acreage yields the proportional weight assigned to each crop's net return. Note: weights sum to 1.00. Thus, the larger the composite farm crop acres the larger the weight in the final tabulation. Crops that are traditionally associated with

doubled-cropping (wheat, barley, and rye) and are entered as negative acres thus, increasing the cropping intensity for the CF. Note: the CF reflects a typical farm in a county and may not reflect any one farm in a county.

Calculating Crop Net Returns and Olympic Averaging
For each county, a crop's net return is the sum of a 7-year Olympic average of crop budgets (explained in more detail later) and a 7-year Olympic average of federal payments (explained below). Seven year Olympic averaging is defined as: from an array of values from the last 7-years the largest and smallest values are removed and the remaining 5-years of net returns are averaged (if there are less than 7-years of data, a straight average is used).

Crop budgets are developed annually for each CF crop within a county by using inputs that include crop prices and yields reported by USDA-NASS. Crop budgets also include annual crop insurance obtained from the Risk Management Agency (USDA-RMA).

Federal Payments
Also, we include crop specific (corn, soybeans, grain sorghum, wheat, barley, peanuts, and cotton) federal payments made to a county. Program payment data is obtained annually via a Freedom of Information Request to USDA-FSA. The per-acre federal payment for each program crop is calculated as follows: the crop specific payment is divided by the number of crop acers from the Ag Census, resulting in a per acre federal payment. As mentioned before, federal payments are also Olympically Averaged. Note, some crops do not have federal payments (e.g. hays, pastures, fruit, and vegetable crops)

County Final Net Returns
The final net returns for the county's CF is the sum of the weighted crop net returns for each crop (weights are described above).

Capitalization and Soil Index
The estimated agricultural value of a CF acre for a county is calculated by dividing the finial net return by the capitalization rate (CR). The CR is defined as the sum of the county's specific effective real estate tax rate (VA Department of Taxation) and the long-term Federal Land Bank interest rate (AgFirst). This division yields an unadjusted per acre value. This unadjusted value is divided by the county's soil index to standardize each counties soil productivity on a state-wide basis. The resulting value is rounded to the nearest $10 and is the county's Class III without risk use-value estimate.

Northampton and Accomack Compared
In Table 1, notice that corn, potatoes, soybeans, and wheat are the largest contributors to each county's Final Net Return and that other crops make smaller contributions. Weights (columns B) are calculated from a county's respective composite farm acres (Table 2 and 3).

Final Net Returns
In Table 1, the Weighted Values (Column C) are the product of each individual crop return (Column A) times it's weight (Column B). The Final Net Returns for each county is the sum of Column C values. Notice that the net return for wheat in Northampton is lower than in Accomack ($97 vs $107), but Northampton's assigned weight is larger than Accomack's

(0.47 vs 0.23). Wheat's actual value after weighting is $46 for Northampton vs $24 for Accomack. Because of this and the other crop weightings, Northampton's Final Net Return value is slightly higher than Accomack ($225 vs $211).

Table 1. Comparisons - Final Net Returns, Crop Net Returns, and Weighting for TY2016						
	Northampton A	**B**	**C**	**Accomack A**	**B**	**C**
	Net Return	*Weight*	*Weighted Value*	*Net Return*	*Weight*	*Weighted Value*
Corn	$146	0.23	**$34**	$168	0.31	**$53**
Potatoes	$931	0.06	**$54**	$857	0.04	**$34**
Soybeans	$130	0.70	**$91**	$160	0.62	**$100**
Wheat	$97	0.47	**$46**	$107	0.23	**$24**
Other crops		0.04	**$0.06**		0.05	**$0.07**
Double-crops		-0.50			-0.26	
Final Net Return		1.00	**$225**		1.00	**$211**

Corn, soybeans, and wheat are the primary crops in both counties with soybeans receiving the highest weight in both. Also, notice that while potatoes do not carry as heavy a weight, none-the-less they were very profitable contributing significantly in each county's Final Net Return.

Crop Acres, Composite Farm (CF) Acres, and Capitalization/Soil Index
Table 2 and 3 show each county's composite (average) farm profile. Notice the crop acreages and the number of farms for each county differs slightly in its composite farm acreage.

Also, Table 2 and 3 show the capitalization rates for Accomack 0.0665 and Northampton 0.0679. They differ because the real property tax rate in Accomack is less than Northampton - included within each capitalization rate is an interest rate component which is the same statewide.

The quality of soil in Accomack (Soil Index 1.309) is slightly higher than in Northampton (Soil Index 1.411). When capitalization rates and individual soil indexes are applied, Accomack has a slightly higher final use-value estimate for Type III without risk land than Northampton (Accomack $2,420 vs Northampton $2,350).

Table 2. Northampton					
TY2016	**Northampton**	147 farms	A	B	A*B =
	Crop acers	**Composite Farm acres**	**Net Returns**	**Composite Farm Weights** (Crop CF ac./Total CF)	**Weight Net Returns**
Corn	8,238	56	$145.55	0.2332	$33.94
Hay	105	1	$0.00	0.0030	$0.00
Wheat	16,649	113	$97.41	0.4712	$45.90
Barley	971	7	$1.60	0.0275	$0.04
Soybeans	24,745	168	$129.73	0.7003	$90.85
Potatoes	2,056	14	$930.66	0.0582	$54.15
Pasture	158	1	$1.78	0.0582	$0.01
Double-cropped	-17,620	-120		-0.4987	
Totals	**35,334**	**240**		**1.00**	**$224.90**
				Tax Rate Capitalization	=224.90/0.0679
				Unadjusted w/out risk	$3,313.16
				Soil Index adjustment	=3,313.16/1.411
				Class III w/out risk	**$2,348.80**
			Class III w/out risk (rounded to nearest $10)		**$2,350**

Table 3. Accomack					
TY2016	**Accomack**	226 Farms	A	B	A*B =
	Crop acers	**Composite Farm acres**	**Net Returns**	**Composite Farm Weights** (Crop CF ac./Total CF)	**Weight Net Returns**
Corn	19,015	84	$168.43	0.3132	$52.75
Hay	329	1	$0.00	0.0054	$0.00
Wheat	13,645	60	$106.45	0.2247	$23.92
Barley	2,366	10	$0.91	0.0390	$0.04
Soybeans	37,930	168	$160.21	0.6247	$100.09
Potatoes	2,403	11	$857.36	0.0396	33.93
Pasture	1,031	5	$1.78	0.0170	$0.03
Double-cropped	-16,011	-71		-0.2637	
Totals	**60,716**	**268**		**1.00**	**$210.76**
				Tax Rate Capitalization	=210.76/0.0665
				Unadjusted	$3,170.25
				Soil Index adjustment	=3,170.25/1.309
				Class III w/out risk	**$2,421.55**
			Class III w/out risk (rounded to nearest $10)		**$2,420**

Crop Budgets

The individual crop net returns shown above in Table 2 and 3 (column a) are based on annual crop budgets that are Olympic averaging over 7-years. Table 4 and 5 summarize the arrays of annual net returns and the low and high years that are removed for the resulting average values. Annual per acre net return crop budgets are calculated based on the profitability of growing a crop within a specific county. Below is a simplified equation defining the process for each crop budget:

Net Return = Income (yield * price) – Costs (fixed and variable) +/- net proceeds from crop insurance[1]

Crop budgets include crop insurance payments made to a county for some crops. Per acre crop insurance values are calculated using crop acreages from the latest Ag Census. Insurance data includes subsidy and indemnity payouts along with premium payments. Premium payments are subtracted from the total subsidy and indemnity payouts resulting in either a gain or loss.

For example, for TY2016 (DY2014) the no-till corn grain crop budget in Northampton includes a yield of 164 bushels, a price paid of $3.90 per bushel, and an insurance payout gain of $22 for a net income of $662. Costs included pre-harvest costs of $359, harvest costs of $103, and fixed machinery and overhead costs of $124 for a total cost of $586. The net return for no-till corn budget in Northampton for TY2016 was $662 (income) minus $586 (costs) equals $76 per acre.

Federal Payments

Annual federal payments paid to a county for a specific crop are divided by the county's crop acres (Ag Census) and result in per acre values. A county's crop budgets and federal payments are Olympic averaged for the previous 7-years. See Tables 4 and 5. Note that crop budgets use data that lags a given tax year by 2 years – this is because of the availability of data from the National Agricultural Statistics Service (USDA-NASS). So, tax year (TY) 2016 uses data from data year (DY) 20014.

Table 4. Northampton (TY2016: $/acre crop budgets and federal payments with Olympic Averaging)

	TY2010	**TY2011**	**TY2012**	**TY2013**	**TY2014**	**TY2015**	**TY2016**	**OlyAvg**
Corn	23.85 L	48.65	76.58	336.84	343.73 H	155.32	76.30	$138.74
Fed Pay	4.72	7.98	4.63	9.23	7.50	11.94 H	0.01 L	$6.81
							Total Net Return	**$145.55**
Potatoes	1,362.08 H	1,110.61	205.00 L	1,358.31	546.59	491.02	1,146.78	$930.66
Fed Pay	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
							Total Net Return	**$930.66**
Soybeans	40.55 L	69.18	144.83	79.80	310.89 H	186.38	136.07	$123.25
Fed Pay	4.80	7.98	4.76	7.75	7.09	8.23 H	0.01 L	$6.48
							Total Net Return	**$129.73**
Wheat	132.65	0.00 L	59.01	137.94	147.41 H	46.37	45.44	$84.28
Fed Pay	11.41	7.98	11.23	18.65	16.76	18.26 H	0.01 L	$13.13
							Total Net Return	**$97.41**
H=Dropped High Value and L=Dropped Low Value								

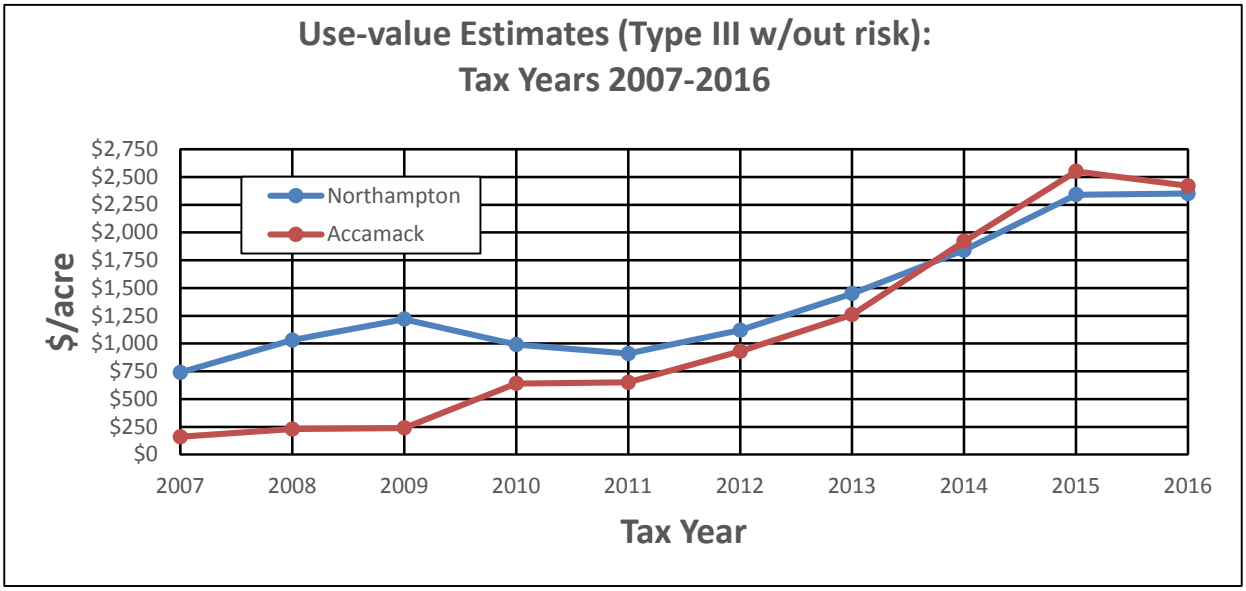
[1] Net proceeds from crop insurance are determined by netting: indemnities (payments to farmers for damages) + subsidies (federal subsidies) – insurance payment (made by farmers). In most years this is a positive value. Data from USDA-RMA by county and by crop.

Table 5. Accomack (TY2016: $/acre crop budgets and federal payments with Olympic Averaging)								
	TY2010	**TY2011**	**TY2012**	**TY2013**	**TY2014**	**TY2015**	**TY2016**	**OlyAvg**
Corn	67.52	11.07 L	93.00	389.32	432.17 H	156.09	64.54	$154.09
Fed Pay	10.89	10.22	10.43	21.88 H	18.25	29.78	0.01 L	$14.33
							Total Net Return	**$168.43**
Potatoes	1,384.43 H	1,091.11	294.00 L	1,187.54	551.60	455.59	1,000.98	$857.36
Fed Pay	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
							Total Net Return	**$857.36**
Soybeans	34.09 L	52.34	250.17	164.12	285.82 H	190.65	101.20	$151.70
Fed Pay	6.13	10.22	6.13	12.53 H	10.49	9.62	0.01 L	$8.52
							Total Net Return	**$160.21**
Wheat	128.13	0.00 L	88.28	123.63	131.75 H	50.01	32.39	$84.49
Fed Pay	19.13	10.22	18.52	36.29 H	32.24	29.66	0.01L	$21.96
							Total Net Return	**$106.45**
H=Dropped High Value and L=Dropped Low Value								

While this discussion has centered on explaining the TY2016 use-value estimates for Northampton and Accomack counties listed in Table 7, it is important to provide a historical look back over the last 10 years of use-value estimates for the two counties (i.e., Type III without risk land estimates). Note that in TY2007 thru TY2009 potatoes were not included in Accomack's composite farm because of NASS's non-disclosure policy. During that time, the use-value modeling process used the 2002 Ag Census. A new Ag census is published every 5-years (e.g., 2002 Ag Census TY2005 to TY2009; 2007 Ag Census TY2010 to TY2014; and 2012 Ag Census TY2015 to current). Because potatoes were not included in Accomack's composite farm from TY2007 thru TY2009, its reported use-value estimate was lower.

Table 7. Use-value Estimates (Type III without risk)										
	TY2007	**TY2008**	**TY2009**	**TY2010**	**TY2011**	**TY2012**	**TY2013**	**TY2014**	**TY2015**	**TY2016**
Northampton	740	1,030	1,220	990	910	1,120	1,450	1,840	2,340	2,350
Accomack	160	230	240	640	650	930	1,260	1,920	2,550	2,420

Figure 1. Use-value Estimates for Northampton and Accomack (Type III w/out risk)



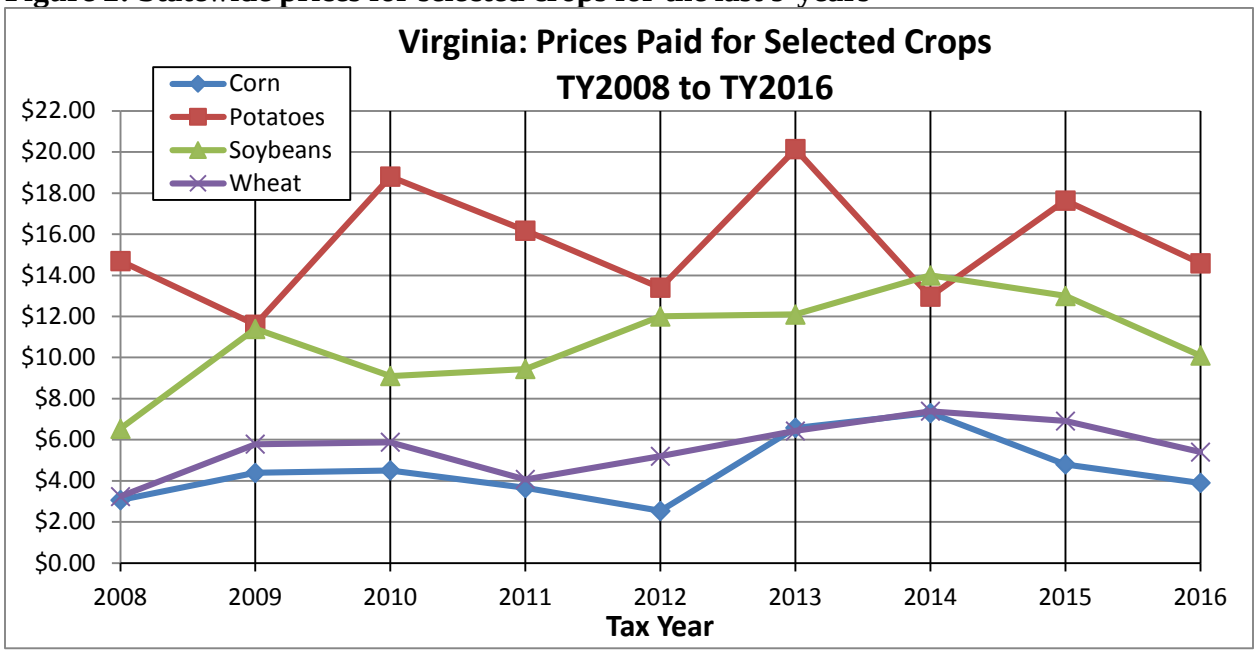
Why are estimates not tracking along with farm-level net returns?
As was discussed above the primary grain and oil seed crops experienced historically high profits during TY2013-TY2015. These three years of net returns will have to work their way through the use-value model as net returns approach more moderate levels driven by state-wide cash market prices shown in Table 6 and Figure 2. In additional, potatoes for both chip and fresh markets vary widely from year-to-year reflecting a four-fold difference over a 7-year period.

Table 6. Virginia Grain and Potato Prices from 2008 to 2014*

	TY2008	TY2009	TY2010	TY2011	TY2012	TY2013	TY2014	TY2015	TY2016
Data Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
Corn	$3.07	$4.39	$4.51	$3.66	$5.54	$6.58	$7.30	$4.80	$3.90
Annual change		*43%*	*3%*	*-19%*	*51%*	*19%*	*11%*	*-34%*	*-19%*
Potatoes	$14.70	$11.60	$18.80	$16.18	$13.40	$20.41	$12.97	$17.64	$14.59
Annual change		*-21%*	*62%*	*-14%*	*-17%*	*52%*	*-36%*	*36%*	*-17%*
Soybeans	$6.54	$11.40	$9.10	$9.44	$12.00	$12.10	$14.00	$13.00	$10.10
Annual change		*74%*	*-20%*	*4%*	*27%*	*1%*	*16%*	*-7%*	*-22%*
Wheat	$3.24	$5.78	$5.88	$4.07	$5.20	$6.43	$7.39	$6.91	$5.40
Annual change		*78%*	*2%*	*-31%*	*28%*	*24%*	*15%*	*-6%*	*-22%*

*Data used in Crop Budgets lag a given tax year (TY by two years due to availability of data).

Figure 2: Statewide prices for selected crops for the last 9-years



Other considerations: 1) as discussed above, there is a data lag of 2 years and estimated values cannot catch up to current values because data must me collected, validated, and analyzed by state and federal agencies before it is published for use by SLEAC in the use-value model; and 2) the process of 7-year Olympic averaging moderates how rapidly values move up or down with values seldom approaching zero or reflecting a single highly profitable year where estimates exceed current market values for land as the current situation reflects.

How long will it take to see decreases in use-value estimates for Northampton and Accomack? Assuming that prices stay at or below their current level, it will be a slow process for new values to displace the record high three years.

Important Note (unrelated to how estimates are calculated): The frequency of real property reassessment cycle in a jurisdiction (county/city) can result in significant changes in the use-values land owners see on their tax bills, that is, "sticker shock." Frequencies of real estate reassessments are based on jurisdictional needs and budget constraints and vary across the state from annual to every sixth year reassessments. Virginia Code requires that cities reassess at a minimum of every 4 years and counties a 6-year minimum. Note: fair market values and use-value assessment can only be applied during the year of reassessment. For example, a county on a 4-6 year reassessment cycle could jump from a historically low use-value estimate to a historically high estimate causing understandable concern about the high values and thus increased taxes levied on the land. This is the situation faced by some of Virginia's counties.