Virginia Cooperative Extension

Why Use-value Estimates Can Differ Between Counties

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Introduction

During September of each year, annual use-value estimates for the upcoming tax-year are voted on for acceptance by the State Land Evaluation Advisory Council (SLEAC)[1] the governing body of the use-value estimate program. The Council's voting members include Virginia's: Tax Commissioner, Commissioner of Agriculture, State Forester, Director of the Department of Conservation and Recreation, and the Dean of the College of Agriculture and Life Sciences at Virginia Tech. One month prior to the September meeting, use-value estimates are presented for public review. The September meeting allows for discussion, explanation, and comments regarding the estimates before a final vote. All the meetings are open to interested individuals to ask questions on values and methods.

Questions are frequently asked about differences in the use-value estimates for neighboring counties and cities[2] as well as increases and/or decreases in estimates from the previous tax-year. During the September 2007 meeting, the question was raised, "Why are Halifax and Pittsylvania counties' use-value estimates for TY2008 so dramatically different?" Since the two counties are located side-by-side and have similar climate, soil, topography, and capitalization rates[3] (without-risk rates[4] of 0.0795 for Halifax and .0810 for Pittsylvania) one would think that their estimates would be similar. However, the TY2008 average use-value estimate ($/acre) for without-risk cropland in Halifax was $260 while the average use-value estimate ($/acre) for without-risk cropland in Pittsylvania was $90. Table 1 shows the TY2008 reported use-value estimates for Halifax and Pittsylvania counties.

What determines use values?

A county's use-value estimate is a function of its *Average Net Return*. For TY2008, the *Average Net Returns* for Halifax and Pittsylvania counties were very different – $20.54 for Halifax and $7.73 for Pittsylvania (Figure 1). The following section explains the use-value estimation process.

Table 1: Estimated use values[a] of agricultural land by jurisdiction for TY2008.

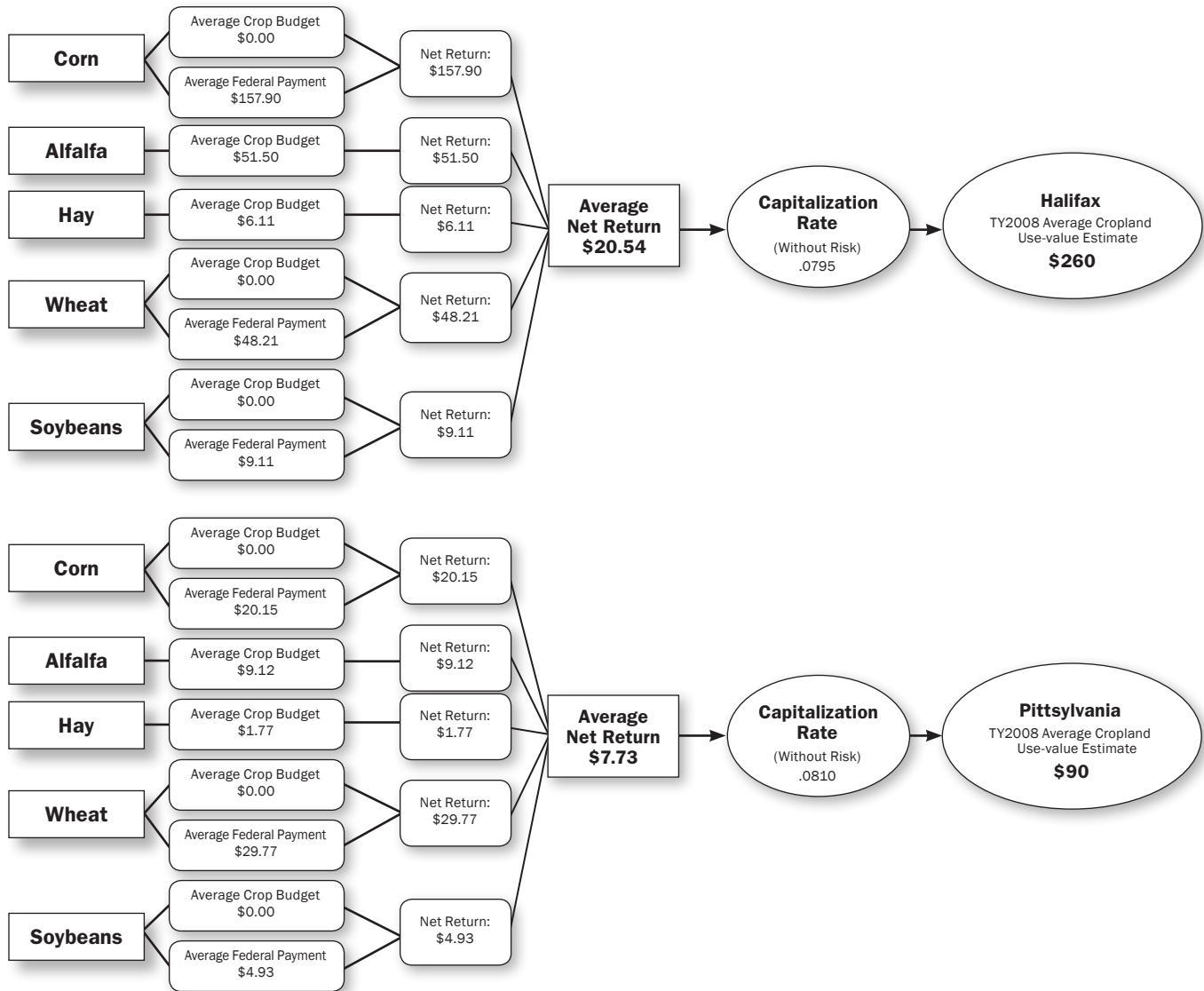|		Cropland				AVG I-IV	Pastureland			AVG V-VII	AVG I-VII	VIII
		I	II	III	IV		V	VI	VII			
Halifax	*W/Out Risk*	330	300	220	180	**260**	130	110	70	**90**	***230***	20
	W/Risk	310	280	210	170	**240**	130	100	60	**80**	***220***	20
Pittsylvania	*W/Out Risk*	120	110	80	70	**90**	50	40	20	**40**	***90***	10
	W/Risk	120	110	80	60	**90**	50	40	20	**40**	***90***	10
[a]$/acre												

[1] For additional information about SLEAC, see the URL: *usevalue.agecon.vt.edu/*

[2] Counties and cities within Virginia choose to participate in the use-value program.

[3] Capitalization rates are unique to each county and are the sum of a property-tax component and an interest-rate component.

[4] The risk associated with excessive rainfall is lower crop yields caused by flooding. Because this risk is borne by specific areas of land within a jurisdiction, a special use-value estimate based on a capitalization rate reflecting the risk of flooding is calculated.

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Figure 1: Use-value Estimation Process Structure

The Use-value Estimation Process

The estimation process begins with calculating per-acre annual crop budgets for each crop grown within a county. Virginia Cooperative Extension develops crop budgets for the primary crops[5] grown within counties. All budget data lags the current tax-year by two years because of the National Agricultural Statistics Service's reporting schedule. Developing crop budgets is somewhat involved and will not be addressed in this document. However, examples of crop budgets are accessible via the Virginia Cooperative Extension website (*www. ext.vt.edu/*). To access an enterprise budget, select *Educational Programs & Resources*, then *Farm Business Management and Marketing*, then *Budgets*.

A county's annual crop budgets for the previous seven years are Olympic averaged.[6] This average is shown in Figure 1 as the *Average Crop Budget*. If an annual crop budget has a negative value, it is set to zero before averaging. Olympic averaging is used to reduce the year-to-year fluctuations caused by unusually good or poor crop years. Some crops also receive an annual federal payment. Crops eligible for federal payments include corn, wheat, barley, soybeans, and cotton. Federal crop payments are calculated on a per-acre basis and Olympic averaged for the previous seven years. The result is the *Average Federal Payment*, which is added to the *Average Crop Budget*. The sum of these two averages is a crop's *Net Return* (Appendix, Table 3).

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[5] For TY2008, the primary crops grown were corn, alfalfa, hay, wheat, barley, soybeans, potatoes, and cotton.

[6] In calculating an Olympic average, the highest and lowest values are dropped prior to calculating the arithmetic mean.

Next, each crop's *Net Return* is combined into the county's *Average Net Return* (Figure 1). A weighted average is calculated using the crop *Net Returns* weighted by the crop acreage in the county's composite farm (Appendix, Table 2). A county's composite farm can be thought of as a typical farm within a county and is calculated by dividing each crop's acreage by the number of farms within the county.[7] Notice that all of the primary crops mentioned earlier may not appear in a county's composite farm. Crops are included only if the division of crop acreage by number of farms results in a value greater than or equal to 1.

After a county's *Average Net Return* is calculated, it is divided by the county's capitalization rate.[8] The result of this division is an unadjusted use-value estimate.[9] The basic formula for calculating an unadjusted use-value estimate is:

$$\text{Use-value Estimate} = \frac{\text{Average Net Return}}{\text{Capitalization Rate}}$$

Capitalization rates are unique to each county and are the sum of a property-tax component and an interest-rate component. A county's property-tax component is a moving straight 10-year average of its effective true real-property tax rate. Property tax rate data lag the tax year by three years with interest-rate data lagging the tax year by two years. For example, for TY2008 the property tax rates were from 1996 to 2005; for TY2007 the property tax rates were from 1995 to 2004; and so on. These rates are published annually by the Virginia Department of Taxation.

The interest-rate component is a weighted average of the long-term interest rates for Virginia charged by Agricultural Credit Associations (ACAs) serving the state. To reduce the variability of the annual use-value estimates, SLEAC elected to take a straight moving average of the weighted long-term interest rates over the 10-year period prior to a given tax year.

Each county's unadjusted use-value estimate is then adjusted for the county's cropland productivity through the use of each county's soil index factor. A county's soil index factor is a weighted average productivity index based on the acreage in cropland (Classes I-IV).

Explanation of Differences

In TY2008, both Pittsylvania and Halifax counties had identical crops (corn, wheat, soybeans, alfalfa, and hay) in their respective composite farms (Appendix, Table 2). As mentioned earlier, a county's crop budget data goes back seven years, beginning with a two-year lag. For this TY2008 example, the relevant data years are 2000 to 2006.

Corn

None of the corn grown in either county from 2000 to 2006 had a positive crop budget (Appendix, Table 3). However, both counties did receive annual federal payments for their corn. So, each county's corn *Average Federal Payment* is the same as its *Net Return* ($157.90 for Halifax and $20.15 for Pittsylvania). From 2000 to 2006, Halifax received an average of $182,353 in federal payments for corn compared to $134,068 for Pittsylvania (Appendix, Table 3).

Soybeans and Wheat

Again, none of the soybean or wheat crops grown in either county from 2000 to 2006 had a positive crop budget (Appendix, Table 3). However, during this time Pittsylvania County received more in average soybean and wheat crop federal payments than Halifax ($22,286 versus $12,143 for soybeans and $210,634 versus $164,543 for wheat; respectively) (Appendix, Table 3). Since Pittsylvania has almost twice as many acres of soybeans and wheat as Halifax (Appendix, Table 2) and because federal payments are calculated on a per-acre basis, the soybeans and wheat *Net Returns* were less for Pittsylvania ($4.93 for soybeans and $29.77 for wheat) than for Halifax ($9.11 for soybeans and $48.21 for wheat).

Alfalfa

Alfalfa and hay crops are not eligible for federal payments; however, Olympic averaging is applied to each crop's *Average Crop Budget*, yielding the final *Net Return*. In Halifax, from 2000 to 2006, there were only three positive alfalfa-crop budget years (2000, 2004, and 2005) and only two positive alfalfa-crop budget years in Pittsylvania (2004 and 2005). The alfalfa *Average Crop Budget* is $51.50 for Halifax and $9.12 for Pittsylvania (Appendix, Table 4).

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[7] County level data on the total number of farms and acreage harvested for each crop are obtained from the most recent Census of Agriculture.

[8] This calculation is the without-risk land capitalization rate. A capitalization rate for with-risk land is also calculated, which is a 5% increase.

[9] This unadjusted estimate is for without-risk land and does not reflect different land characteristics within a jurisdiction. Use-value methodology adjusts for soil type within a county and annually publishes estimates for each of the eight Natural Resources Conservation Service (NRCS) land capability classifications.

Hay

A major difference in the counties' reported use-value estimates in TY2008 was due to each county's hay crop. Hay acreage in both counties is over five times that of any other crop acreage, making it a key component in their *Average Net Returns*. From 2000 to 2006, each county had positive hay budgets for the same two years (2000 and 2005). But, Olympic averaging drops the highest and lowest budgets (Appendix, Table 4). For both counties, the high hay budget was in 2006, which was dropped, leaving only one positive hay-budget year, 2000 (each county had a zero hay-budget year, which was dropped as their low value).

Differences in the counties' 2000 hay budgets is a result of differences in their respective hay yields: Halifax's hay yielded 2.5 tons per acre compared to the Pittsylvania hay yield of 2.1 tons per acre (Appendix, Table 5). Most other aspects of each county's hay budget are similar, including identical hay prices. Therefore, the differences in the counties' *Average Crop Budgets* for hay ($6.11 for Halifax and $1.77 for Pittsylvania) can be attributed to differences in hay yield.

Conclusion

The three major factors contributing to differences in use-value estimates between jurisdictions are illustrated by comparing Pittsylvania and Halifax counties. These factors are: 1) county crop yields as reported by Virginia Agricultural Statistics Service; 2) county-specific participation rates by farmers in federal programs; and 3) county property tax rates.

Even slight differences in annual crop yields can dramatically affect crop budgets. Using an annual hay crop as an example, a difference of 0.3 tons/acre yield results in an over three times greater return for a hay crop budget. Federal program payments usually differ between counties because there are differences in the number of farms, program crop acreages, and choices by farmers to sign up for federal programs.

A 10-year moving average of a county's annual effective tax rate for real property is a key component in calculating capitalization rates used in determining base land values. This moving average lags the current tax year by three years. For example, in TY2008 rates are from 1996 to 2005. In TY2008, the average effective tax rates for use value program participants ranged from a low of 0.34 in Halifax to a high of 1.34 in Petersburg. Even subtle differences in tax rates can affect use-value estimates.

Therefore, while there may be other factors not mentioned in this example which influence use-value estimates, individuals should first look at these three items in helping explain the between jurisdiction differences in use-value estimates – crop yield, federal program participation, and property tax rates.

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Appendix

Number of Farms, Crop Acreages, and Composite Farms

Pittsylvania County has 44 percent more farms than Halifax County (1,304 and 905, respectively) with significantly more total crop acreage in Pittsylvania than in Halifax (53,200 and 27,231, respectively). Each county's composite farm-crop acreage is calculated by dividing its crop acreage by the number of farms in the county. The total composite farm size in Pittsylvania is 41 acres while in Halifax it is only 30 acres (Table 2).

Table 2. Halifax and Pittsylvania: Farms, Crop Acreage, Composite Farm Acres, and Net Returns (TY2008).

Crop	Halifax				Pittsylvania			
	Number of Farms	*Acres*	*Composite Farm Acres[b]*	*Net Returns $/acre*	*Number of Farms*	*Acres*	*Composite Farm Acres*	*Net Returns $/acre*
	905				1,304			
Corn		1,169	1	157.90		5,942	5	20.15
Alfalfa		1,115	1	51.50		1,908	1	9.12
Hay		23,967	26	6.11		42,310	32	1.77
Barley[a]		D				414		
Wheat		3,358	4	48.21		6,178	5	29.77
Soybeans		978	1	9.11		3,068	2	4.93
Potatoes		2				7		
Cotton								
Total		*27,231*	*30*	*20.54 [3]*		*53,200*	*41*	*7.73[c]*

[a] D = Not Disclosed

[b] Composite Farm crop acreage is crop acreage divided by the number of farms.

[c] Weighted mean of the crop net returns weighted by composite farm acreage.

Table 3. Halifax and Pittsylvania: Budgets, Federal Payments, and Net Returns – Corn, Wheat, and Soybeans *(2000-2006).*

Crop	Year	Halifax Budget $/ acre	Halifax DCP[a] $/ county	Halifax DCP $/ acre		Pittsylvania Budget $/ acre	Pittsylvania DCP $/ county	Pittsylvania DCP $/ acre	
Corn	2000	0.00	163,206.24	139.61		0.00	234,114.80	39.40	
	2001	0.00	158,644.94	135.71		0.00	153,006.50	25.75	
	2002	0.00	174,984.00	149.69		0.00	129,000.82	21.71	
	2003	0.00	194,909.43	166.73		0.00	105,589.34	17.77	
	2004	0.00	194,909.43	166.73		0.00	105,589.34	17.77	
	2005	0.00	194,909.43	166.73		0.00	105,589.34	17.77	
	2006	0.00	194,909.43	166.73		0.00	105,589.34	17.77	
Average			*182,353*				*134,068*		
Olympic AVG[b]		*0.00*		*157.90*		*0.00*		*20.15*	
Net Return $ /acre[c]					*157.90*				*20.15*
Wheat	2000	0.00	186,667.05	55.59		0.00	385,136.52	62.34	
	2001	0.00	154,650.42	46.05		0.00	207,333.68	33.56	
	2002	0.00	162,019.26	47.95		0.00	202,885.52	32.84	
	2003	0.00	162,116.79	48.28		0.00	169,771.44	27.48	
	2004	0.00	162,116.79	48.28		0.00	169,771.44	27.48	
	2005	0.00	162,116.79	48.28		0.00	169,771.44	27.48	
	2006	0.00	162,116.79	48.28		0.00	169,771.44	27.48	
Average			*164,543*				*210,634*		
Olympic AVG		*0.00*		*48.21*		*0.00*		*29.77*	
Net Return $ /acre					*48.21*				*29.77*
Soybeans	2000	0.00	40,478.21	41.39		0.00	54,426.32	17.74	
	2001	0.00	35,865.77	36.67		0.00	80,350.92	26.19	
	2002	0.00	0	0		0.00	0	0	
	2003	0.00	2,165.12	2.21		0.00	5,307.64	1.73	
	2004	0.00	2,165.12	2.21		0.00	5,307.64	1.73	
	2005	0.00	2,165.12	2.21		0.00	5,307.64	1.73	
	2006	0.00	2,165.12	2.21		0.00	5,307.64	1.73	
Average			*12,143*			0.00	*22,286*		
Olympic AVG		*0.00*		*9.11*		*0.00*		*4.93*	
Net Return $ /acre					*9.11*				*4.93*

[a] Federal Direct and Counter-Cyclical Program Payments

[b] In calculating an Olympic average, the highest and lowest values are dropped prior to calculating the arithmetic mean.

[c] Net Return = Crop Budget Olympic Average + DCP Olympic Average.

Table 4. Halifax and Pittsylvania: Budgets and Net Returns - Alfalfa and Hay *(2000-2006).*

		Halifax	Pittsylvania
	Year	*Budget $*	*Budget $*
Alfalfa	2000	244.64	0.00
	2001	0.00	0.00
	2002	0.00	0.00
	2003	0.00	0.00
	2004	35.75	0.00
	2005	221.75	45.58
	2006	0.000	254.78
Net Return (Olympic Average)		*51.50*	*9.12*
Hay	2000	30.56	8.85
	2001	0.00	0.00
	2002	0.00	0.00
	2003	0.00	0.00
	2004	0.00	0.00
	2005	0.00	0.00
	2006	63.41	95.03
Net Return (Olympic Average)		*6.11*	*1.77*

Table 5. Halifax and Pittsylvania: Alfalfa and Hay Yields[a] *(2000-2006).*

			Halifax	Pittsylvania
Crop		*Year*	*Yield*	*Yield*
Alfalfa	tons/acre	2000	5.6	2.8
	tons/acre	2001	3	2.5
	tons/acre	2002	2.6	2.1
	tons/acre	2003	2.1	2.4
	tons/acre	2004	3.2	3.3
	tons/acre	2005	3.8	3.8
	tons/acre	2006	1.3	2.3
Hay (All)	tons/acre	2000	2.5	2.1
	tons/acre	2001	1.8	1.8
	tons/acre	2002	1.5	1.6
	tons/acre	2003	2	2.6
	tons/acre	2004	2.6	2.3
	tons/acre	2005	2.4	2.6
	tons/acre	2006	1.5	1.9

[a] From National Agricultural Statistics Service, www.nass.usda.gov/Data_and_Statistics/index.asp