Why does Goochland have higher use-value estimates than Spotsylvania and Orange Counties for tax year 2016?

Franklin A. Bruce, Jr, Senior Project Associate, Department of Agricultural and Applied Economics, Virginia Tech
Gordon E. Groover, Extension Economist, Farm Management, Department of Agricultural and Applied Economics, Virginia Tech

That's a very good question. It has taken awhile to figure it out. As they say, the devil can be in the details which seems to be the case here.

Agriculture Census

Importantly, a county's crop net return (whatever it may be) is weighted according to the county's crop acreage (taken from the latest Agricultural census). The census provides all of the crop acres and the number of farms within a county. For TY2016, we are using the 2012 Ag Census.

Composite Farm acres and Weighted

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 traditional associated with doubled-cropping (wheat, barley, and rye) are entered as negative "crop double-crop" acres thus, increasing the cropping intensity for the CF.

Crop Net Returns and Olympic Averaging

Net returns are calculated based on crop budgets developed for each crop that makes up the CF for all counties using prices and yields reported by USDA-NASS. The net returns for each crop for the past seven years are Olympically Averaged (if there are less than 7-years of data it is straight averaged). We define 7-year Olympic averaging as follows: From the array of net returns from the last 7 years the largest and smallest values are removed and the remaining 5 years of net returns are averaged.

Federal Payments and Olympic Averaging

Finally, 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 CF, resulting in a per acre federal payment. The federal payments are also Olympically Averaged. The federal payment Olympic Average is added to the crop budget net return yielding a final Net Return for each crop. 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 finial 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 value is divided by the county's soil index (adjusts for changes in soil from county-to-county). The resulting value is rounded to the nearest $10 and is the county's Class III without risk use-value estimate.

Goochland, Spotsylvania, and Orange: Why differences for TY2016?
See Table 1. Notice that the same crops in each county contributed the most in each county's final net return. Those crops are: Corn, Wheat, and Soybeans. Each county's crop net return, weight, and weighted value are shown. The weighted values are totaled and result in the final net return. While other crops in each county contributed in their final net return, their contribution are small (See Table 1 below).

Both hay and pasture crops are heavily weighted in each county's composite farm. In Spotsylvania and Orange neither hay nor pasture were profitable (See Table 3 and 4) – however, Goochland's pasture did make a modest contribution of $0.49 to its final net return (See Table 2).

In Table 1, the bolded weighted values for each county are the actual summed values. Even though Goochland's net returns for corn were lower than Orange's, because of the weighting calculated from their respective composite farms, Goochland weighted value is higher. When all three crops weighted values for corn, wheat, and soybeans (and other crops) are totaled Goochland has the highest final net return. To see how the final net returns are capitalized and adjusted and become use-value estimates see Tables 2 thru 4.

Table 1. Comparisons - Final Net Returns, Crop Net Returns, and Weighting for TY2016

	Goochland			**Spotsylvania**			**Orange**		
	Net Return	*Weight*	*Weighted Value*	*Net Return*	*Weight*	*Weighted Value*	*Net Return*	*Weight*	*Weighted Value*
Corn	$120.94	0.19	**$22.61**	$99.92	0.10	**$10.09**	$165.43	0.10	**$16.09**
Wheat	$70.70	0.09	**$6.29**	$97.12	0.03	**$2.74**	$61.49	0.05	**$3.19**
Soybeans	$156.17	0.12	**$18.70**	$157.81	0.13	**$20.29**	$188.46	0.10	**$19.21**
Other crops		0.60	**$0.61**		0.74	**$0.56**		0.75	**$0.59**
Final Net Return		1.00	**$48.21**		1.00	**$33.69**		1.00	**$39.08**

Table 2. Goochland					
TY2016	**Goochland**	315 farms	a	b	a*b =
	Crop acers	**Composite Farm acres**	**Net Returns**	**Composite Farm Weights**	**Weight Net Returns**
Corn	5,946	19	$120.94	0.19	$22.61
Alfalfa	182	1	$33.01	0.01	$0.19
Hay	6,373	20	$0.00	0.20	$0.00
Wheat	2,829	9	$70.70	0.09	$6.29
Barley	D	0	$0.00	0.00	$0.00
Soybeans	3,808	12	$156.17	0.12	$18.70
Pasture	15,478	49	$0.85	0.49	$0.42
Double-cropped	-2,829	-9			
Totals	31,801	101			**$48.21**
				Tax Rate Capitalization	=48.21/0.0677
				Unadjusted	$712.42
				Soil Index adjustment	=712.42/1.156
				Class III w/out risk	**$620**

Table 3: Spotsylvania					
TY2016	**Spotsylvania**	369 Farms	a	b	a*b =
	Crop acers	**Composite Farm acres**	**Net Returns**	**Composite Farm Weights**	**Weight Net Returns**
Corn	2,536	7	$99.92	0.10	$10.09
Alfalfa	352	1	$22.28	0.01	$0.31
Hay	9,538	26	$0.00	0.38	$0.00
Wheat	707	2	$97.12	0.03	$2.74
Barley	426	1	$15.00	0.02	$0.25
Soybeans	3,228	9	$157.81	0.13	$20.29
Pasture	9,445	26	$0.00	0.38	$0.00
Double-cropped	-1,133	3			
Totals	25,102	69			**$33.69**
				Tax Rate Capitalization	=33.69/0.0694
				Unadjusted	$485.61
				Soil Index adjustment	=485.61/1.265
				Class III w/out risk	**$380**

Table 4: Orange					
TY2016	**Orange**	547 farms	a	b	a*b =
	Crop acers	**Composite Farm acres**	**Net Returns**	**Composite Farm Weights**	**Weight Net Returns**
Corn	6,493	12	$165.43	0.10	$16.09
Alfalfa	481	1	$13.49	0.01	$0.10
Hay	19,987	37	$0.00	0.30	$0.00
Wheat	3,468	6	$61.49	0.05	$3.19
Barley	1,733	3	$18.91	0.03	$0.49
Soybeans	6,804	12	$188.46	0.10	$19.21
Pasture	32,952	60	$0.00	0.49	$0.00
Double-cropped	-5,201	10			
Totals	66,755	121			**$39.08**
			Tax Rate Capitalization		=39.08/0.0691
				Unadjusted	$565.64
			Soil Index adjustment		1.127
			Class III w/out risk		**$500**