Section 1
Estimating the Use Value of Agricultural Land

The State Land Evaluation Advisory Council (SLEAC) is required to base its estimates of the use value of agricultural and horticultural lands on productive earning power determined by the capitalization of cash rents or by capitalization of net incomes of like real estate (Section 58.1–3239 of the Code of Virginia). Reliable cash rents were unavailable or very thin in many jurisdictions and SLEAC elected to base its use-value estimates on the capitalization of net income. However, in calendar year 2009, published rental rates became available from NASS for tax year (TY) 2010. This section describes the methodology SLEAC uses in estimating the use value of agricultural land and provides clarification, when necessary. Prince Edward County is used as an example for TY2008.

The Composite Farm

The agricultural sector in Virginia is very heterogeneous. A typical agricultural operation located along the Eastern Shore is very different from an operation in the Southwest. For this reason, an accurate estimation of agricultural use values required developing a composite (i.e. typical) farm for each jurisdiction participating in the use-value program. County level data on the total number of farms and acreage harvested for each crop are obtained from the most recent Census of Agriculture. To calculate the composite farm acreage for a crop within a county, the acreage for each crop is divided by the total number of farms in the county. If this division results in a value greater than or equal to 1, the crop is included in the composite farm. It is also necessary to calculate a county’s double-cropped acreage because it is assumed that only one crop is grown annually on agriculture land. Winter annuals, e.g., winter wheat, barley, and rye crops, are assumed to always be followed by another crop, e.g., corn or soybeans. Therefore, they are considered double-crop acreage. Summing the total acreage of winter annuals and dividing by the number of farms, results in double-crop composite farm acres. The double-crop composite acreage is subtracted from the total, reflecting true crop rotation acreage within a jurisdiction.

For example, in TY2008, Prince Edward County had 395 farms and 1,430 corn acres harvested (Table 2, Appendix C). Therefore, Prince Edward County has 4 acres of corn in its composite farm. This process is continued for each single and double-cropped crop acreage yielding a composite farm having a mixture of corn, alfalfa, hay, wheat, and barley, with a total of 39 acres.

Net Farm Income

Net Return Budgets

The next step in the use-value estimation procedure is to determine net return budgets for each crop grown on the composite farm. Net returns are calculated by developing an enterprise budget for each primary crop grown. In TY2008, the primary crops used in the use-value estimation of agricultural land were corn, alfalfa, hay, wheat, barley, soybeans, potatoes, and cotton. By basing net return budgets on all primary crops, crop rotations are implicitly incorporated.

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3 Annual jurisdictional capitalized rental rates and a description of the methods used in calculating the these rates for cropland and pastureland are available at: http://usevalue.agecon.vt.edu/RentalRates.htm. Historical (5 to 7 years of data) capitalized rental rates may provide a second data source for jurisdictions in setting values when approved by SLEAC.

4 County or city.

5 Crop acreages for TY2008 are from the 2002 Ag Census. The census is updated every 5 years and lags the tax year in which it is initiated by 3 years (e.g., 2002 Ag Census initiated in TY2005; and the 2007 Ag Census initiated in TY2010). Acreage calculations from a census include:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Acreage Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>corn-grain acres + corn-silage acres; and</td>
</tr>
<tr>
<td>Hay</td>
<td>(all hay + all haylage, grass silage, greenchop)</td>
</tr>
<tr>
<td></td>
<td>- alfalfa hay + haylage from alfalfa or alfalfa mixtures.</td>
</tr>
</tbody>
</table>

6 Composite crop acreages are rounded to the nearest whole number, e.g., 3.6202 is rounded to 4.

7 Total composite farm acres sometimes do not add exactly due to rounding; and, some crop acres are not listed due to NASS disclosure rules.

8 A complete listing of the enterprise budgets and data sources is available at http://pubs.ext.vt.edu/

9 Structural changes in production agriculture necessitate occasional changes in the primary crops. For TY2011, the primary crops were: corn, alfalfa, hay, wheat, barley, soybeans, potatoes, cotton, pasture, peanuts, tobacco, beans (green limas), cucumbers, pumpkins, sweet corn, tomatoes, and watermelons.
In TY2010, pasture was included as a crop within the use-value model. The use-value Technical Advisory Committee (TAC) approved the inclusion. Pasture yield is converted from hay (all) yield using the following formula:

\[
\text{Pasture Yield} = (\text{Hay\_All Yield/ 0.75}) \times 0.44
\]

Also, pastureland use values are imputed from net returns on lower productive lands in each jurisdiction. Use values for both cropland and pastureland are reported in Table 1a (Appendix B).

In determining the net return for a crop budget, an annual per acre net return budget is derived for each crop grown on the composite farm. Enterprise budgets, largely derived from Virginia Farm Management crop budgets, and input costs from numerous government and industry sources are used to determine annual crop net return budgets. Much of the data lags the tax year by two years due to the availability of crop yields and prices reported by the Virginia Field Office of the National Agricultural Statistics Service (VASS).

In TY2010, a process for merging annual per acre crop net return budgets together was initiated. Currently, for some crops there is only one crop budget (e.g., alfalfa, hay, and cotton). However, for others (e.g. corn, soybeans, and tobacco) there can be two or more crop budgets which are combined. For example, a jurisdiction’s corn budget is a merger of its corn-minimum tillage budget and corn-conventional tillage budget.

Jurisdictional annual per acre crop net return budgets for the previous 7 years (each budget lags its corresponding tax year by 2 years) are averaged using a moving 7-year Olympic average. A moving Olympic average is defined as an arithmetic mean calculated after first dropping the highest and lowest values within a data series. The average is moving in that the data series used is relative to a given tax-year. For example, for TY2008 the use-value net return budget data series is from data year (DY) 2000 to data year (DY) 2006, for TY2007 the data series is from DY1999 to DY2005, and so on.

The Olympic averaging process helps mitigate fluctuations in the annual use-value estimates caused by unusually good or poor years. In the event a net return budget is negative, its value is set to zero. For example, the net return budgets for alfalfa in Prince Edward County were (see that negative values are set to zero and for 7-year Olympic Averaging, high and low values are dropped):

<table>
<thead>
<tr>
<th>Data Year</th>
<th>$/acre</th>
<th>7-year Olympic Averaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>DY2000</td>
<td>39.07</td>
<td>39.07</td>
</tr>
<tr>
<td>DY2001</td>
<td>0.00*</td>
<td>Dropped</td>
</tr>
<tr>
<td>DY2002</td>
<td>0.00*</td>
<td>0.00</td>
</tr>
<tr>
<td>DY2003</td>
<td>135.21</td>
<td>135.21</td>
</tr>
<tr>
<td>DY2004</td>
<td>191.94</td>
<td>Dropped</td>
</tr>
<tr>
<td>DY2005</td>
<td>52.79</td>
<td>52.79</td>
</tr>
<tr>
<td>DY2006</td>
<td>55.54</td>
<td>55.54</td>
</tr>
</tbody>
</table>

Olympic Average $56.52

* Negative values are set to zero.

Dropping the highest ($191.94) and lowest ($0.00) values and averaging the remaining five years, provides an estimated per acre average net return budget for alfalfa of $56.52 (Appendix C, Table 2 – line 3).

Federal Direct and Counter-Cyclical Program Payments (Federal Payments)

In the absence of federal payments, the above process for estimating a net return from a crop enterprise is sufficient. However, when federal payments are made to farms in a county, they must be included as a source of

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10Pasture acreage is calculated from the Ag Census 2007. It is the sum of acreages for:

- Cropland used only for pasture and grazing;
- Pastureland and rangeland, other than cropland and woodland pastured; and
- Woodland pastured.


12Annual per acre crop budgets lag a given tax year by 2 years (e.g., TY2008’s annual per acre crop budget data is from data year (DY) 2006).


14Merging weights for crop budgets are calculated for some crops from annual acreages reported by NASS. In TY2010, Tobacco and Potato budget merging weights were calculated. Merging other crops budgets (e.g., corn and soybeans), use historical tillage weights (percentages) which were updated in TY2007 by the Conservation Technology Information Center (CTIC).