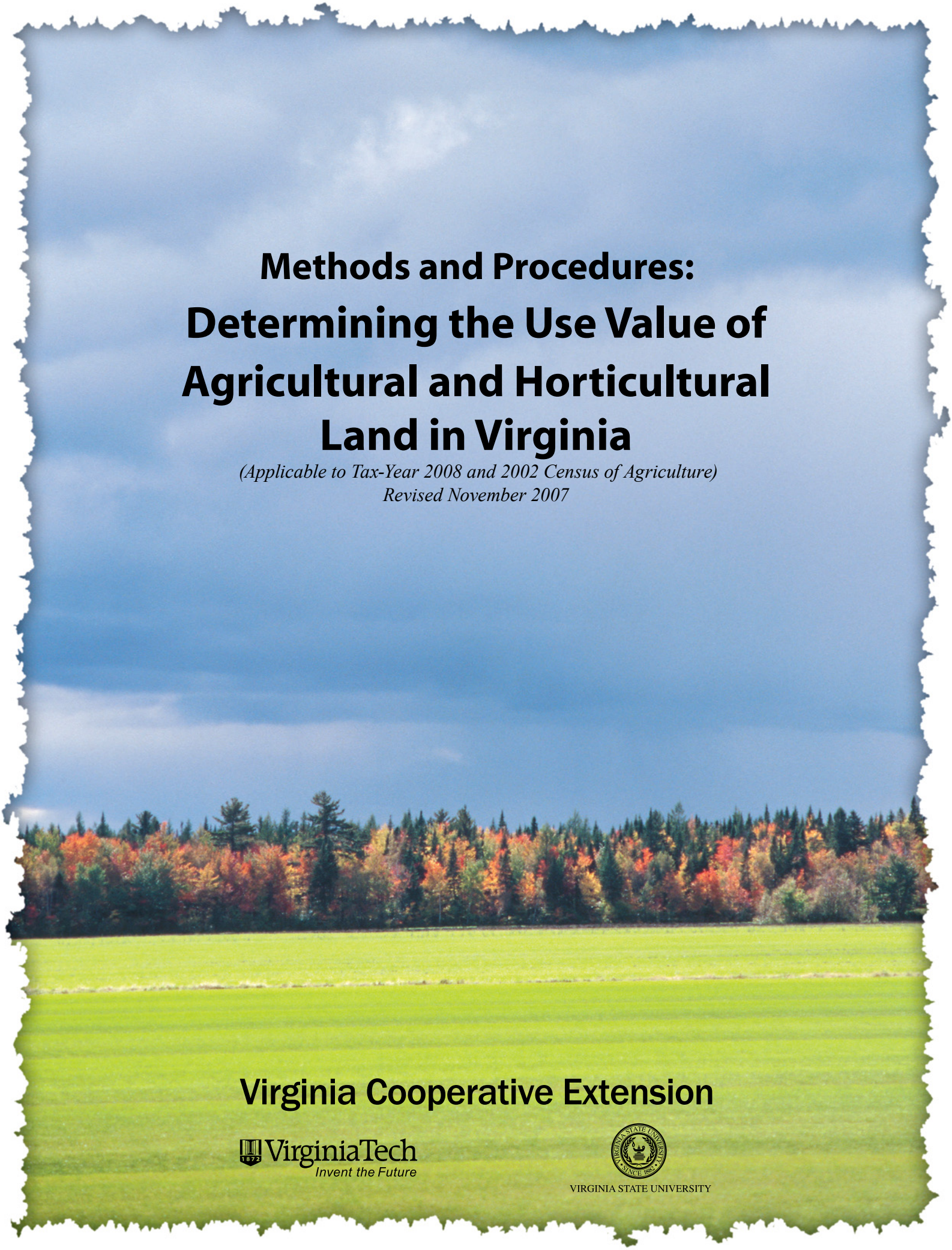

Methods and Procedures:
Determining the Use Value of Agricultural and Horticultural Land in Virginia

(Applicable to Tax-Year 2008 and 2002 Census of Agriculture)
Revised November 2007

Virginia Cooperative Extension

VirginiaTech
Invent the Future

VIRGINIA STATE UNIVERSITY

Methods and Procedures:

Determining the Use Value of Agricultural and Horticultural Land in Virginia

(Applicable to Tax-Year 2008 and 2002 Census of Agriculture)
Revised November 2007

Franklin A. Bruce, Jr.
Department of Agricultural and Applied Economics
Project Associate, Use-value Program
Virginia Polytechnic Institute and State University
301-A Hutcheson Hall (0401)
Blacksburg, VA 24061
Office: (540) 231-4441
E-mail: fbruce@vt.edu

Gordon E. Groover
Department of Agricultural and Applied Economics
Extension Economist, Farm Management
Virginia Polytechnic Institute and State University
206-A Hutcheson Hall (0401)
Blacksburg, VA 24061
Office: (540) 231-5850
E-mail: xgrover@vt.edu

Acknowledgments

The authors would like to acknowledge the contributions and collective efforts of the many individuals who labored on the use-value model to improve the estimation methods and processes presented in this document. These persons, committees, and councils include, but are not limited to:

William Folmar
David Lamie
Monica Licher
J. Paxton Marshall
Beth Ann Pelletier
Edward Van Eenoo
Technical Advisory Committee (TAC)[1]
State Land Evaluation and Advisory Council (SLEAC)[1]

[1]A complete list of members is available on the website for the Virginia's Use-Value Assessment Program, URL: *usevalue.agecon.vt.edu/*

Contents

Introduction 1

Section 1 – Estimating the Use Value of Agricultural Land 3
- The Composite Farm 3
- Net Farm Income 3
  - Net Return Budgets 3
  - Federal Direct and Counter-Cyclical Program Payments (Federal Payments) 4
  - Final Estimated Net Return 5
- Capitalization Rate 5
  - Interest-rate Component 5
  - Property-tax Component 5
  - Risk Component 6
- Calculating Use Values 6
  - Adjusting for Variations in Capability 6
  - Soil index factor 7
  - Using average use-value estimates 8
- Transfer-in data 8
  - Split Counties: Census and Net Returns 8
  - Transfer-in Jurisdictions: Effective Tax Rates 8
  - Transfer-in Jurisdictions: Soil Index 8

Section 2 – Estimating the Use Value of Horticultural Land 9
- The Composite Orchard 9
- Net Orchard Income 9
- Capitalization Rate 10
- Calculating Use Values 10
  - Step 1 – Calculate net returns for orchard land 10
  - Step 2 – Calculate the portion of use value attributable to trees only 11
  - Step 3 – Multiply by the appropriate index number 11
  - Step 4 – Add the appropriate agricultural land use-value estimate 11

Appendix A – Farm Example 13

Appendix B – What is reported? 15
- Table 1a 15
- Table 1b 17
- Brochure: Estimated Use Value of Agricultural and Horticultural Land in Prince Edward 18

Appendix C – Prince Edward County: Tables 2, 3, 4, and 5 21

Appendix D – Data Sources 27

Introduction

Virginia law allows localities to adopt a program of assessing agricultural, horticultural, forestry, and/or open-space lands based on the value of what the lands produce (use value) instead of their market value. This document addresses methods and procedures for determining the use value of agriculture and horticulture land only. The use value of agricultural land is defined as the amount one could expect to receive from crops (e.g., corn, alfalfa, and wheat) grown on the land, with the use value of horticultural land defined as the amount one could expect to receive from tree fruit (e.g., apple, peach, and pear). These special assessments only apply to what is produced on the land and not such things as livestock, buildings, and/or other improvements.

All 50 states have some form of use-value taxation, suggesting support for preserving this land and reducing the taxes on land used to produce food, fiber, and timber. In 1974, Virginia passed legislation enabling localities to provide tax relief to landowners in order to preserve agricultural, horticultural, forestry, and/or open-space lands for the explicit purpose of the public benefit from its preservation.

The purpose of this document is to explain the reasoning behind Virginia's use-value program and the processes used in calculating use-value estimates for agricultural and horticultural land in the cities and counties participating in the program. Provided are step-by-step explanations of the methods used in developing the final use-value estimates. A hypothetical farm in Prince Edward County is used to illustrate how the use-value program is applied to agricultural land (Appendix A). All use-value reports (See Tables 1a, 1b, and the Brochure in Appendix B) generated in calculating estimates for Prince Edward County are provided in the appendices. Use-value estimates and reports for all counties and cities participating in the program are available at the use-value website.[2]

The rationale for the use-value program includes Section 58.1–3229 of the *Code of Virginia*, which declares that "the preservation of real estate for agricultural, horticultural, forest, and open-space use is in the public interest and … the classification, special assessment, and taxation of such property in a manner that promotes its preservation helps foster long-term public benefits." Virginia law allows for eligible land in any of these categories to be taxed based upon the land's value in *use* (use value) as opposed to the land's *market* value. Section 58.1–3239 of the *Code* establishes the State Land Evaluation Advisory Council (SLEAC) and directs it to estimate the use value of eligible land for each jurisdiction participating in the land-use program. SLEAC contracts annually with the Department of Agricultural and Applied Economics at Virginia Tech to develop an objective methodology and to estimate the use value of land in agricultural and horticultural use for counties and cities participating in the use-value program. A Technical Advisory Committee (TAC), comprised of professionals familiar with Virginia agriculture, was established in 1998 to provide guidance on the technical aspects of developing an appropriate methodology.

The following organizations have representatives on the TAC:

1. Virginia Department of Agriculture and Consumer Services
2. Virginia Agricultural Statistics Service
3. Virginia Department of Forestry
4. Virginia Department of Conservation and Recreation
5. Virginia Cooperative Extension
6. Virginia Department of Taxation
7. Department of Crop and Soil Environmental Sciences, Virginia Tech
8. Department of Horticulture, Virginia Tech
9. Department of Agricultural and Applied Economics, Virginia Tech

The methodology for determining the use value of agricultural and horticultural land described in this publication represents the combined judgment of these individuals and has been officially sanctioned by SLEAC.

[2]usevalue.agecon.vt.edu/

Section 1
Estimating the Use Value of Agricultural Land

SLEAC is required to base its estimates of the use value of agricultural and horticultural lands on the productive earning power as determined by the capitalization of cash rents or by the capitalization of net incomes of like real estate (Section 58.1–3239 of the *Code of Virginia*). Since rental markets are very thin in many jurisdictions and published rental data are unavailable, SLEAC elected to base its use-value estimates on the capitalization of net income. 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 the tax year 2008 (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[3] 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 agricultural land. Winter annuals, e.g., winter wheat, barley, and rye crops, are assumed to always be crops 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, thus reflecting true crop rotation acreage within a jurisdiction.

For example, Prince Edward County has 395 farms and 1,430 corn acres harvested (Table 2-Appendix C).[4] Therefore, Prince Edward County has 4 acres[5] 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.[6]

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[7] 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.[8] By basing net return budgets on all primary crops, crop rotations are implicitly incorporated.

The methodology employed does not directly include net returns to pastureland. Data limitations coupled with the wide diversity among livestock operations make an accurate estimation of pastureland net returns infeasible at this time. Instead, 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).

[3]County or city.

[4]All crop acreages are from Ag Census 2002. Acreage calculations include for TY2008:
Corn acreage = corn-grain acres + corn-silage acres; and
Hay acreage = (all hay + all haylage, grass silage, greenchop) - (alfalfa hay + haylage or greenchop from alfalfa or alfalfa mixtures).

[5]Composite farm crop acreages are rounded to the nearest whole number, e.g., 3.6202 is rounded to 4.

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

[7]A complete listing of the enterprise budgets and data sources is available at *www.ext.vt.edu/resources/*

[8]Structural changes in production agriculture necessitate occasional changes in the primary crops.

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).[9]

Annual net-return budgets are averaged using a moving seven-year Olympic average for each crop. 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 2000 to 2006, for TY2007 the data series is from 1999 to 2005, 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 TY2008 net-return budgets for alfalfa in Prince Edward County were:

TY2008 Prince Edward County, alfalfa net return budgets (per acre)

Year	$/acre	Values averaged
2000	39.07	39.07
2001	0.00*	Dropped
2002	0.00	0.00
2003	135.21	135.21
2004	191.94	Dropped
2005	52.79	52.79
2006	55.54	55.54
	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 farm revenue.[10] Currently, federal program payments exist for corn, wheat, barley, cotton, and soybeans. The federal payments received by a county for each program crop are divided by the number of crop acres[11] grown, resulting in per-acre payments. Since federal payments can vary from year to year, this calculation is made for each of the previous seven years. Federal payment data also lag the current tax year by two years and are also estimated using a moving seven-year Olympic average. The averages of federal payment for crops in a county's composite farm are added to the average of the net return budgets to arrive at a county's total crop net returns.

For example, the TY2008 per-acre federal payments for wheat in the Prince Edward County were:

TY2008 Prince Edward County, wheat federal payments (per acre) [12]

Year	$/acre	Values averaged
2000	155.17	155.17
2001	153.83	Dropped
2002	123.58	Dropped
2003	150.51	150.51
2004	150.51	150.51
2005	150.51	150.51
2006	150.51	150.51
	Olympic Average	**$151.17**

The average of *Prince Edward County's* wheat federal payments is $151.17.

[9] *www.nass.usda.gov/Statistics_by_State/Virginia/index.asp*

[10] Due to limitation in the software, Olympic averaging uses data from the current census only.

[11] Cropland harvested acreage is a subset of total agricultural acreage that does not include planted acreage that is not harvested.

[12] Due to limitation in the software, Olympic averaging uses data from the current census only.

TY2008 net-return budgets for wheat during the past seven years in Prince Edward County are listed below (negative values have been set to zero):

TY2008 Prince Edward County, wheat net return budgets (per acre)

Year	$/acre	Values averaged
2000	0.00*	Dropped
2001	0.00	0.00
2002	0.00	0.00
2003	0.00	0.00
2004	0.00	0.00
2005	58.47	Dropped
2006	6.51	6.51
	Olympic Average	$1.30

*Negative values are set to zero.

The average for Prince Edward County's wheat net-return budgets is $1.30. Adding the average wheat federal payment of $151.17 to the average wheat net return of $1.30, results in total crop net returns of $152.48 (Appendix C, Table 2 – line 5). This procedure is performed for each primary crop comprising at least one or more acres of cropland harvested on the county's composite farm.[13]

Final Estimated Net Return

To calculate a single final estimated net return for the crops grown on a county's composite farm, a weighted average is calculated using the crop net returns and its corresponding composite farm acreages as weights. The result is the per-acre final Estimated Net Return of harvested cropland for a jurisdiction. For Prince Edward County, the Estimated Net Return from cropland harvested is $18.20 per acre (Appendix C, Table 2 – line 11).[14]

Capitalization Rate

A basic capitalization rate is the sum of a property-tax component and an interest-rate component. In some jurisdictions, the capitalization rate can include a risk-of-flood component. Capitalization-rate components are listed in Table 3 (Appendix C, Section 2).[15]

Interest-rate Component

The interest-rate component of the capitalization rate is a weighted average of the long-term interest rates charged by agricultural credit associations (ACAs) serving Virginia. These data lag the tax year by two years. 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 ten-year period prior to a given tax year. For example, for TY2008 data for long-term interest rates are from 1997 to 2006. Therefore, the moving straight ten-year average of the long-term rate is *7.61 percent* (Appendix C, Table 3 – line 2a). The same rate is used for all jurisdictions. This long-term interest-rate average reflects an alternative return to owning agricultural land over an extended period of time. The same long-term interest-rate component used for agricultural land is also used for horticultural land.

Property-tax Component

The property-tax component, also a moving straight ten-year average, is an average of the effective true real-property tax rate published annually by the Virginia Department of Taxation. Property tax data lags the interest-rate and net-income data by three years. Therefore, the estimated property-tax component applicable to TY2008 relies on data from the years 1996 to 2005. The property-tax component used for agricultural land is also used for horticultural land. The sum of the interest rate and property tax rate equals the basic capitalization rate. For example, Prince Edward County's property-tax component is 0.0043, which when added to the long-term interest rate component, results in a capitalization rate of 0.0895 (Appendix C, Table 3 – line 2c).

[13]Cropland harvested acreage is a subset of total agricultural acreage that does not include planted acreage that is not harvested.

[14]A complete listing of recent net returns applicable to participating jurisdictions is provided at *usevalue.agecon.vt.edu/*.

[15]A complete listing of the capitalization rate components applicable in each jurisdiction is available for public inspection at the Virginia Department of Taxation.

Risk Component

Agricultural enterprises are subject to numerous risks. However, the risks associated with input costs, crop yields, and prices received are adequately accounted for by the net-return component since these risks occur on an across-the-board basis and do not reflect individual land-risk situations. The two primary types of risks explicitly considered in the use-value methodology are related to rainfall, either a shortage or an excessive amount. An important difference between the two is that the risk associated with drought *is not* land-related while the risk associated with excessive rainfall *is* land-related. The risk of drought is assumed to be distributed uniformly within a jurisdiction and, therefore, does not warrant special attention.

Because the risk associated with an excessive rainfall is land-related, it can vary within a jurisdiction. The risk associated with excessive rainfall is lower crop yields caused by flooding. This situation mainly occurs in the southeastern part of the state but also occurs in other regions, usually to a lesser extent. 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.

The size of the risk component will vary depending on the period over which a total crop loss is expected on lands subject to the effects of flooding. Use-value methodology assumes that a total crop loss will occur on land at risk of flooding once every 20 years. Therefore, the land's capitalization rate is increased by 5 percent. For example in Prince Edward County, the risk component is calculated to be 0.0040 (Appendix C, Table 3 – line 2d). Adding this component to the without-risk capitalization rate results in a *with-risk* capitalization rate of 0.0845 (Appendix C, Table 3 – line 2e).

The estimated use values of agricultural land are provided in Table 1a. *The* with-risk *estimates should only be used when an individual land tract is known to have poor drainage that cannot be remedied by tilling or drainage ditches*. Land devoted to horticultural use will rarely be subject to these conditions. For this reason, SLEAC elected not to consider the risk of flooding in the use-value estimates for horticultural crops.

Calculating Use Values

Once a per-acre net-return and capitalization rate for a jurisdiction have been estimated, calculating its use value is straightforward. The basic formula is:

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

From this formula, changes in a use-value estimate are obvious. An increase in a jurisdiction's use value is caused either by an increase in net return and/or a decrease in the capitalization rate. A decrease in use value is caused either by a decrease in the net return and/or an increase in the capitalization rate.

For example in Prince Edward County, the *without-risk* capitalization rate is *0.0805* (Appendix C, Table 3 – line 2c). Therefore, the initial use value for *without-risk* cropland harvested is:

$$\text{Use value} = \frac{\$18.20}{0.0805} = \$226.17$$

This calculation is referred to as an unadjusted *without-risk* value because it has not yet been adjusted for variations in soil capability (Appendix C, Table 3 – line 3). The unadjusted *with-risk* value is simply a jurisdiction's net return divided by its *with-risk* capitalization rate.

Adjusting for Variations in Capability

The initial unadjusted use-value estimate does not reflect different land characteristics within a jurisdiction. Section 58.1–3239 of the *Code* directs that SLEAC annually publish use-value estimates for each of the eight Natural Resources Conservation Service (NRCS) land capability classifications.[16]

Agricultural professionals generally agree that Land Capability Classes I through III are most capable of producing cultivated annual crops. Land Capability Class IV is also capable of producing cultivated annual crops, but intensive conservation treatment is required. Land Capability Classes V through VII are generally suited for pasture and in some instances orchard. Land Capability Class VIII has practically no agricultural value. Therefore, land Capability Classes I through IV are designated as suitable for harvested crops (i.e. cropland harvested). Land Capability Classes V through VII are designated as suitable for other agricultural uses, primarily pasture.

[16]Agriculture Handbook No. 210 (Issued September 1961, Approved for reprinting January 1973) URL: *soils.usda.gov/technical/handbook/contents/part622.html#cap_cls*.

Statewide Land Capability Classifications	
Class I	Soils have few limitations that restrict use.
Class II	Soils have some limitations that reduce the choice of plants or require moderate conservation practices.
Class III	Soils have severe limitations that reduce the choice of plants or require special conservation practices, or both.
Class IV	Soils have very severe limitations that restrict the choice of plants, require very careful management, or both.
Class V	Soils are subject to little or no erosion but have other limitations impractical to remove that limit their use largely to pasture, range, woodland, or wildlife food and cover.
Class VI	Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover.
Class VII	Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife.
Class VIII	Soils and landforms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, or water supply or to aesthetic purposes.

The most direct way to adjust for differences in land capability would be to develop a set of enterprise budgets for each land class. Unfortunately, much of the data is not reported at this level. Therefore, SLEAC approved the use of an index to adjust use values for the various land capability classifications.

Class III land was chosen as the base class and assigned an index of 1.[17] The use value of agricultural land in other classes is adjusted based on its income-generating potential relative to the base class. SLEAC approved the following indices for each Land Capability Class to adjust use-value estimates relative to the base class.

Virginia Land Capability Class Index (Agricultural Land)	
Class I	1.50
Class II	1.35
Class III	1.00
Class IV	0.80
Class V	0.60
Class VI	0.50
Class VII	0.30
Class VIII	0.10

The scale implies that the expected net income from Class I is 1.5 times that of Class III; the expected net income from Class II is 1.35 times that of Class III land; the expected net income from Class IV is only 0.80 times that of Class III land; the expected net income from Class V is only 0.60 times that of Class III land, and so on.

Soil index factor

Since the mix of land classes differs among jurisdictions, it is not appropriate to simply use an unadjusted without-risk (or with-risk) use-value estimate (Appendix C, Table 3 – Section 3) that would be used as the use-value estimate for Class III land.[18] An adjustment is made by calculating a soil index factor. The factor, which is the weighted average of the land capability (productivity) indices (Classes I – IV) in each jurisdiction[19] where cropland acreage of classes I – IV in the jurisdiction, provides the weights.

In Prince Edward County, the soil index factor is calculated as 1.149 (Appendix C, Table 3 – Section 4). This value means that a typical acre of land in Prince Edward County is between Class II (1.35) and Class III (1.00). Since the unadjusted without-risk use value of cropland harvested for Prince Edward County was $226.17 (Appendix C, Table 3 – line 3), that value is divided by the soil index factor of 1.149. This yields a without-risk use-value estimate for Class III land of $196.93 per acre. Multiplying this value by each of the other land class indices provides the remaining without-risk use-value estimates (Appendix C, Table 3 - Section 5). The same process is used in calculating a jurisdiction's with-risk use-value estimates, by using the unadjusted with-risk use value. Note that the final estimated values are rounded to the nearest $10, e.g., the use-value estimate for Class III of $196.93 is reported as $200 (Appendix B, Table 1a).

[17]The decision to make Class III the base is arbitrary and has no impact on the final use-value estimates.

Using average use-value estimates

When the soil capability classes of an individual real estate tract are known, using the adjusted use-value estimates could improve equity. However, in many jurisdictions, these data do not exist.[20] Therefore, Appendix B Table 1a lists the weighted average use-value estimates for cropland harvested (land classes I through IV), pastureland (land classes V through VII), and total agricultural land (land classes I through VII). At the discretion of the assessing officer, the pastureland use value may be applied to land in any class that is strictly used for grazing.

Transfer-in data

The data used for estimating the use value of agricultural land are not published for all towns and for only a few of Virginia's independent cities. When data do not exist for a town or city participating in the use-value taxation program, data from an adjacent county are used. The process is referred to as "transferring-in data." For example, Chesterfield County uses transfer-in data from Amelia County (Appendix B, Table 1a).

Split Counties: Census and Net Returns

Transfer-in data are also used for jurisdictions that are spilt by the "Fall Line."[21] These split counties are unique because their western side is comprised of Piedmont soils and crops and their eastern side is comprised of Coastal Plain soils and crops. Currently, Dinwiddie, Hanover, and Henrico counties are split counties and data are transferred in from adjacent counties with similar soil. For example, Dinwiddie County's Coastal Plain region uses transfer-in data from Prince George County, while its Piedmont region uses transfer-in data from Nottaway County.

In a split county, the county's own census data are used in calculating composite farm acreage. As a result, there are identical composite farm acreages for both regions within a split county. As with other transfer-in counties, a split county's crop net-return budgets are transferred-in from an adjacent county. However, a split county *does not* transfer-in federal payments. Rather, federal payments paid to the split county are used for both regions. For example, both of Dinwiddie's Coastal Plain and Piedmont regions use federal payments paid to Dinwiddie County.

Transfer-in Jurisdictions: Effective Tax Rates

When a jurisdiction is *not* split and uses transfer-in data, the transfer-in county's *composite farm* and *average net returns* are identical to the receiving jurisdiction. But, the final use-value estimates for a receiving county and its transfer-in county will differ because each jurisdiction uses its own effective tax rate to arrive at the capitalization rate.

For example, Buena Vista City transfers in data from Rockbridge County. Therefore, both Buena Vista and Rockbridge County have identical census data, composite farm acreages, crop net returns, and final Estimated Net Return. But, Buena Vista's *unadjusted* use-value estimates will differ from Rockbridge out because each county's moving straight ten-year average effective property tax rate is different (An explanation of these rates is provided in Section I – Capitalization Rate).

Transfer-in Jurisdictions: Soil Index

When a county uses transfer-in data (including split counties), its unadjusted use-value estimates are divided by the *transfer-in county's soil index* factor to calculate its adjusted use-value estimates. For example, Buena Vista transfers-in data from Rockbridge County and uses Rockbridge County's soil index factor in calculating its adjusted use-value estimates.

[18]Not adjusting use-value estimates in jurisdictions with high concentrations of land in classes I and II would overestimate Class III estimates while underestimating Class III estimates in jurisdictions with low concentrations of land in classes I and II.

[19]Data on land acreage in each land class is available in the *Virginia Conservation Needs Inventory* (1967).

[20]These data can be generated by using soil surveys and tax map overlays or through self-reporting but the process is costly and difficult to verify.

[21]See *www.virginiaplaces.org/regions/fallshape.html* for a definition of the Fall Line.

Section 2
Estimating the Use value of Horticultural Land

Unlike the *annual* investments made in traditional agricultural enterprises, most horticultural investments extend over many years. SLEAC provides use-value estimates of horticultural land devoted to orchard use. Unlike agricultural land, the data required for the estimation of orchard use values are largely unavailable from published, secondary sources. Therefore, these estimates are based largely upon the professional opinion of Virginia Cooperative Extension and Department of Horticulture personnel knowledgeable in the area of apple and peach production.

For land devoted to vineyards and nurseries where data limitations make the estimation of use values problematic, SLEAC does not provide explicit use-value estimates. Instead, it recommends that each jurisdiction impute vineyard and nursery use values[22] from the use-value estimates published for agricultural land. The use value of the vineyard or nursery items on the land (i.e. trees, plants, etc.) may be appraised by a jurisdiction's assessing officer and then added to the agricultural use value of the land.

The Composite Orchard

The composite orchard is based on a typical Virginia apple operation. The use values of other types of orchards (i.e. peach, cherry, pear, and plum) are imputed from the apple orchard values and adjusted by varying the depreciation rate. The profitability of apple orchards can vary substantially depending upon the type of operation (fresh or processed fruit), rootstock, planting density, age of the trees, and management practices. To further complicate matters, the data required to objectively establish a typical apple orchard are not available from secondary sources. Therefore, a typical apple orchard was subjectively defined by making the following assumptions:

1. The orchard is planted at a density of 135 trees per acre with semi-dwarf rootstock.

2. 70 percent of the fruit is sold to the processed market, and 30 percent is sold to the fresh market.

3. 10 percent of the trees are pre-production age (one to four years), 25 percent are early production age (five to ten years), 50 percent are full production age (11 to 25 years), and 15 percent are late production age (26 to 30 years).

Local adjustments to the use-value estimates applicable to orchards (Appendix B Table 1b) may be necessary depending on the specific characteristics of the orchard being assessed.

Net Orchard Income

Unlike annual agricultural operations, perennial orchard enterprises require several years of capital investments prior to realizing any positive income flow. These initial investments greatly complicate the estimation of net returns. Capital investments made during the pre-production years are assumed to be borrowed through regular financial channels at the same long-term interest rate used in the agricultural budgets. It is assumed that this debt is paid down in later years when the annual net return to the orchard enterprise becomes positive.

Appendix C, Table 4 shows the annual input costs incurred in the production of both processed and fresh market apples for the four production stages. The initial establishment costs are assumed to be the same for both production types and are averaged into the preproduction costs. Total annual revenues are calculated for each age group by multiplying price received by yield. The annual production costs are subtracted from annual revenues to arrive at an annual net income or loss (values in parentheses represent a net loss). For example, in TY2008 a typical apple orchard in Virginia with a preproduction (one to four years) orchard devoted to processing apples realized an annual net *loss* of $1,489.32 per acre (Appendix C, Table 4). An orchard in full production (11 to 25 years) realized an annual net *loss* of $134.11 per acre (Appendix C, Table 4).

A summary of the per-acre net returns as well as the percent of total trees for each of the four production stages is provided in Appendix C, Table 5 – Section 1.

[22]SLEAC. Manual of the State Land Evaluation Advisory Council. 2003, p.45. URL: *usevalue.agecon.vt.edu/procedures.htm* [November 2, 2007].

An average of these net returns, weighted by the percent of total trees, yields the 2006 net return to orchards. The average net return lags the tax year by two years. For example, for TY2008 using the report generated for Prince Edward County as an example, a typical Virginia composite apple orchard realized a net *loss* of $1,390.19 (Appendix C, Table 5 – line 2a). Orchard net returns for the previous seven years are provided in Appendix C Table 5, lines 2a – 2g. Taking a moving seven-year Olympic average of the net returns shows a gain of $6.81 per acre (negative returns are rounded to zero) (Appendix C, Table 5 – line 3a).

Capitalization Rate

The capitalization rate used for determining the use value of orchards consists of the capitalization rate used for agricultural land[23] plus a depreciation component. The depreciation component provides for recovery of the capital invested in an asset that declines in productivity with age. The effect of the depreciation component is to assign lower use values to orchards comprised of trees with a shorter productive life. SLEAC assumes a productive life of 30 years for apple trees and 20 years for peach, cherry, pear, and plum trees. The resulting depreciation component is 0.033 for apple trees and 0.05 for other trees. The depreciation components are applicable only to trees since land value does not generally depreciate over time.

Calculating Use values

While per-acre net returns and capitalization rates have been determined, the procedure is different than it was for agricultural land since the calculated orchard net return is for trees and land. A few more steps are required.

First, the depreciation components can only be applied to the net returns of **trees only**. Because the orchard net return (Appendix C, Table 5 – line 3a) is a combination of trees and land, the net return from equivalent agricultural land must be subtracted prior to capitalizing. The net return equivalent agricultural land is calculated by dividing a jurisdiction's net return for agriculture land by its soil index factor (Appendix C, Table 5, line 3b). That value is then subtracted from the net return to trees and land (Table 5, lines 3a) and results in the net return attributable to *trees only*.

Second, a separate land class index scale for orchards is applied. Orchard production is most successfully accomplished on land with specific attributes. Of particular importance is the landscape. General agreement among professionals familiar with the orchard industry is that Classes II through IV lands are best for commercial fruit production. Class I land often lacks adequate air drainage, while the poor soil and steep slope of Class V through VII lands often make production costs prohibitive.

As with the use-value estimates for agricultural land, SLEAC elected to use an index to adjust the use value of land devoted to orchards for the various land classes. SLEAC approved the following index to adjust orchard use-value estimates for the various land classes relative to the base classes.

Virginia Land Class Index (Orchards)	
Class I	0.80
Class II - IV	1.00
Class V	0.75
Class VI	0.60
Class VII	0.40
Class VIII	0.00

These indices can be interpreted in the same fashion as the indices for agricultural land. Class II, III, and IV land is considered the base and, therefore, receives the index of 1. Net returns to orchards on Class I land are estimated at 80 percent of the base, net returns to Class V land are estimated at 75 percent of the base, and so on.

Calculating a jurisdiction's use value of orchard land is outlined in the four steps presented below. Calculations are shown in Appendix C, Tables 3 and 5.

Step 1 – Calculate net returns for orchard land

The first step in estimating the use value of orchard land is to determine the average net returns per acre for the previous seven years. Annual net return budgets for orchards are averaged using a moving seven-year Olympic average. For TY2008, Prince Edward County's net return average for orchard land was $6.81 (Appendix C, Table 5 – line 3a).

[23]See in this document: Section 1 – Capitalization Rates.

Step 2 – Calculate the portion of use value attributable to trees only

The amount calculated in Step 1 represents the average net return per acre of **both** *trees* and *agricultural land*. Since the depreciation component of the capitalization rate applies *only to the trees*, net returns to *agricultural land* are subtracted prior to applying the capitalization rate.

For example, in TY2008 Prince Edward County's Estimated Net Returns for *agricultural land* were $18.20 (Appendix C, Table 3 – Section 1) and its soil index factor is 1.149 (Appendix C, Table 3 – Section 4). Dividing the county's Estimated Net Return by its soil index factor, results in the Net Return for *only agricultural land*. For Prince Edward County, the Net Return for only *agricultural land* is $15.85 (Appendix C, Table 5 – line 3b). Subtracting $15.85 from the TY2008 orchard net return of $6.81 yields the portion of net return attributable to *trees only* which is a *net loss* of $9.03 (Appendix C, Table 5 – line 3c).

Each jurisdiction uses two capitalization rates – one for apple trees and another for other trees. Each rate is the sum of the state's annual moving straight ten-year average of the long-term interest rates and the jurisdiction's moving straight ten-year average of its effective property tax rate (published annually by the Virginia Department of Taxation) plus a depreciation rate.

For Prince Edward County, the average long-term interest rate is 0.0761 and average effective property tax rate is 0.0043 (Appendix C, Table 5 – lines 4a and 4b), summing the two results in a capitalization rate of 0.0805. Then, separate depreciation rates for apple trees and other trees are added. For apple trees 0.0333 is added and 0.05 is added for all other trees, resulting in final capitalization rates of 0.1138 for apple orchards and 0.1305 for other orchards (Appendix C, Table 5 – lines 4e and 4f).

Step 3 – Multiply by the appropriate index number

Dividing the *net return* calculated for *trees only* by the apple orchard and other orchard capitalization rates results in apple trees and other trees use-value estimates for Class II, III, and IV land. The remaining use-value estimates are calculated by multiplying the value in these three land classes by the respective orchard index.

For example, in Prince Edward County the net return attributable to trees only is a *net loss* of $9.03 (Appendix C, Table 5 – line 3c). If this amount is divided by the capitalization rates for apple orchards and other orchards (0.1138 and 0.1305, respectively), the result is the reported use value for apple trees and other trees. The estimates are *net losses* of $79.41 and $69.25, respectively. Multiplying these amounts by the corresponding orchard index for the remaining land classes results in the county's use-value estimates for apple trees and other trees (Appendix C, Table 5 – Section 5).

Step 4 – Add the appropriate agricultural land use-value estimate

The total use value of *apple orchard* real estate for a jurisdiction is calculated by combining the jurisdiction's use-value estimate attributable to *apple trees* and its use-value estimate attributable to *agricultural land*.

In the *Prince Edward County* example, the Class III apple trees use-value estimate is a *net loss* of $79.41 for Class III apple trees (Appendix C, Table 5 – Section 5). This value is then multiplied by the corresponding orchard index, in this case is 1. This value must then be added to the county's Class III agriculture land (without-risk) use value estimate, $196.93 (Appendix C, Table 3 – Section 5). Summing the two provides an *apple trees and land* estimate of $117.52 (Appendix C, Table 5 – Section 5). Finally, the estimate is rounded to the nearest $10, resulting in a use-value estimate of $120, which is the use-value estimate that is reported in Appendix B, Table 1b for *Prince Edward County,* Class III - Apple. The same process is used in generating use-value estimates for each of the remaining capability classes.

The total use value of *other orchard* real estate for a jurisdiction is calculated the same way as is *apple orchard* except that use-value estimates attributable to *other trees* are used.

Appendix A
Farm Example

Consider a farm in Prince Edward County in TY2008 with 349 acres. Assume the farm is comprised of 113 acres of Class I land, 130 acres of Class II land of which 82 acres has poor drainage, 5 acres of Class III land, and 1 acre of Class IV land with good drainage. It also has 100 acres of Class VI land with good drainage.

To understand all the details of this example requires knowledge of the procedures and methods employed in developing a county's use-value estimates. Some of the terms, for example, Class I Land and with-risk, are explained in other sections of this document.

Using an abbreviated Table 1a (Appendix B) as reference to determine the per-acre use value of the land with good drainage (without-risk) and with poor drainage (with-risk), the assessed value of the farm would be:

Class I Land	(113 acres)	X	($300/acre)	=	$33,900
Class II Land					
Good drainage	(48 acres)	X	($270/acre)	=	$12,960
Poor drainage	(82 acres)	X	($250/acre)	=	$20,500
Class III Land	(5 acres)	X	($200/acre)	=	$1,000
Class IV Land	(1 acre)	X	($160/acre)	=	$160
Class VI Land	(100 acres)	X	($100/acre)	=	$10,000
Total Use-Value Assessment					**$78,520**

If the data on land class composition and drainage were not available, the average use-value estimates (Average Ag. Land, I -VII) could be used. For this farm, the assessed value would be

Class I – VII Land	(349 acres)	X	($200/acre)	=	$69,800
Total Use-Value Assessment					**$69,800**

Note: The tax paid by the owner (assuming that the owner meets all eligibility requirements for use-value assessment) of the 349 acres would be based on Prince Edward's real property tax rate times the total use-value assessment (either $78,520 or $69,80). If the land contained farm structures, e.g., a poultry house and/or grain bins, they would be taxed at their fair market value. Use-value assessment only applies to land.

For example, in Prince Edward County the property tax rate for 2007 was $0.57 per $100 of assessed valuation. Assuming that land class composition and drainage information was available for the farm example above would mean that the farm's property tax would be $447.56 ($78,520 X 0.0057).

Appendix B
What is reported?

Each year, final use-value estimates[24] are provided to Virginia Department of Taxation for agricultural (Table 1a) and horticultural lands (Table 1b) for jurisdictions participating in the use-value taxation program. Also, all participating jurisdictions in the use-value taxation program receive a brochure with their estimated use value for agricultural land and orchard land by land class. Included in the brochure are contacts with addresses and phone numbers as well as the URL for the use-value website.

Reported in Table 1a

This is a report that lists the estimated use values of agricultural land for jurisdictions participating in the use-value taxation program. Use-value estimates are shown for each of eight Soil Conservation Service land capability classifications[25] as well as averages for: Class I-IV (Average Cropland), Class V-VII (Average Pastureland), and Class I-VII (Average Agricultural land). Class VIII land is not included in any of the averages because it is considered to have practically no agricultural value. An example Table 1a (Selected Jurisdictions) is provided in this section.

Using estimates by soil classification can help improve equity in the tax system when data are available on land composition of individual land tracts within a jurisdiction. However, when capability classification acreage data are not available, the average estimates for cropland, pastureland, or total land should be used. At the discretion of the assessing officer, the pastureland use value may be applied to land in any class that is strictly used for grazing.

Separate use-value estimates are reported for land not at risk of flooding (without-risk) and land that is at risk of flooding (with-risk). The with-risk values should only be employed when an individual land tract is known to have poor drainage that cannot be corrected by tiling or drainage ditches.

[24]In Tables 1a and 1b, the use-value estimates are dollars per acre and have been rounded to the nearest $10.

[25]See Section 1 – Calculating use values of this document, for an explanation of capability classifications.

Table 1a: Estimated use values of agricultural land by jurisdiction (Selected Jurisdictions)

Use values are estimated for each of the eight Soil Conservation Service Land Capability Classifications. Average values are reported for cropland (classes I - IV), pastureland (classes V - VII), and agricultural land (classes I - VII). Class VIII land is not included in the average use value of agricultural land because class VIII land is not considered suitable for agricultural purposes. The with-risk values refer to land that is at risk of flooding. These values should only be used when the soil has poor drainage that is not remedied by tiling or drainage ditches or when the land lies in a floodplain. See the end of the document for additional information.

Estimates apply to tax-year **2008**.

		Cropland				Average Cropland	Pastureland			Average Pasture-land	Average Ag. land	Other Land
		I	II	III	IV	I - IV	V	VI	VII	V - VII	I - VII	VIII
Jurisdiction		- - -

Reported in Table 1b

This is a report that lists the estimated use values for orchard land in all jurisdictions participating in the use-value taxation program. Separate use-value estimates are made for apple orchards and other orchards. "Other" refers to orchards dedicated to peach, cherry, plum, and pear production. Differences in these estimates are the result of the lower depreciation rate used for apple orchards than are used for other types of orchards. Use-value estimates are reported for each of eight Soil Conservation Service land capability classifications. This level of information can help improve the equity of the tax system when data are available on the land class composition of each individual land tract in a jurisdiction. When no such data exist, it is recommended that the use value of Class III orchard be applied to all orchard operations within the jurisdiction.

Land devoted to horticultural use will rarely be at risk of flooding. For this reason, the SLEAC elected not to consider the risk of excess rainfall in the use-value estimates for horticultural crops.

Table 1b: Estimated use values of land in orchard by jurisdiction (Selected Jurisdictions)

The use values of apple and other orchards are estimated for each of eight Soil Conservation Service land capability classifications. Other orchard refers to peach, cherry, pear, and plum orchards. The values indicated represent the use value of both land and trees. See the end of the document for additional information.

Estimates apply to **TY2008**.

		I	II	III	IV	V	VI	VII	VIII
Jurisdiction		- **Dollars** -							
County of									
Accomack	Apple	260	200	130	80	60	50	30	20
	Other	270	220	140	90	70	60	30	20
Chesterfield > Amelia	Apple	260	210	120	80	60	50	30	20
	Other	270	220	140	90	70	60	30	20
Dinwiddie County, Coastal Plain Region > Prince George	Apple	190	160	100	70	50	50	30	20
	Other	200	160	110	80	60	50	30	20
Prince Edward	Apple	230	190	120	80	60	50	30	20
	Other	240	200	130	90	70	60	30	20
City of									
Buena Vista > Rockbridge	Apple	200	170	110	80	60	50	30	20
	Other	210	180	120	90	60	50	30	20

Transfers (>): The data used for estimating the use value of agricultural land are not published for all towns and for only a few of Virginia's independent cities. When data do not exist for a town or city participating in the use-value taxation program, the estimated use values from an adjacent or surrounding county are used. This process is referred to as transferring-in. Transferring-in is also used for jurisdictions with large areas of land lying in more than one physiographic region, for example, Coastal Plain and Piedmont. When a transfer-in jurisdiction has been used, it appears after an arrow (>).

Questions regarding any *statutorily* related issues surrounding use-value assessment should be directed to Keith Mawyer or Tom Morelli at the Property Tax Unit, Virginia Department of Taxation. Questions regarding the *technical* aspects of the methodology used to produce the use-value estimates reported in this brochure should be directed to Lex Bruce or Gordon Groover at the Departement of Agriucultural and Applied Economics, Virginia Tech.

Land Capability Classifications	
Class I	Soils have few limitations that restrict use.
Class II	Soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.
Class III	Soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.
Class IV	Soils have very severe limitations that restrict the choice of plants, require very careful management, or both.
Class V	Soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover.
Class VI	Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover.
Class VII	Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife.
Class VIII	Soils and land forms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, or water supply, or to aesthetic purposes.

TY 2008 USE-VALUE ESTIMATES

Table 1: *Estimated use value of agricultural land in* ***Prince Edward****. ($ / Acre)*

Land Class	*Use Value Without Risk*[5]	*Use Value With Risk*[5]
I	300	280
II	270	250
III	200	190
IV	160	150
Avg. I - IV	**230**	**210**
V	120	110
VI	100	90
VII	60	60
Avg. V - VII	**80**	**70**
Avg. I - VII	**200**	**180**
VIII	20	20

[5]N.A. = not applicable

Table 2: *Estimated use value of orchards land in* ***Prince Edward****. ($ / Acre)*

Land Class	*Use Value of Apple*	*Use Value of Other*
I	230	240
II	190	200
III	120	130
IV	80	90
V	60	70
VI	50	60
VII	30	30
VIII	20	20

Contacts

Keith Mawyer, and **Tom Morelli**, Property Tax Unit, Virginia Department of Taxation, Richmond VA 23218-24600 (804) 367-8020

Lex Bruce, Project Associate, Department of Agricultural and Applied Economics, Virginia Tech Blacksburg, VA 24061 (540) 231-4441

Gordon Groover, Extension Economist, Farm Management Department of Agricultural and Applied Economics, Virginia Tech, Blacksburg, VA 24061 (540) 231-5850

Estimated Use Value of Agricultural and Horticultural Land in Prince Edward

Estimates apply to Tax Year 2008

November 29, 2007

State Land Evaluation and Advisory Committee (SLEAC)

Virginia Department of Taxation

For additional information regarding methods and estimation procedures for agricultural and horticulture land use values see http://usevale.agecon.vt.edu.

USE VALUE TAXATION IN VIRGINIA[1]

Virginia law allows for *eligible* land in agricultural, horticultural, forest, or open space use to be taxed at the value in *use* (use value) of the land as opposed to its *market* value. The State Land Evaluation and Advisory Council (SLEAC) was created in 1973 with the mandate to estimate the use value of eligible land for each jurisdiction participating in the use-value taxation program. SLEAC contracts annually with the Department of Agricultural and Applied Economics at Virginia Tech to develop an objective methodology for estimating the use value of land in *agricultural* and *horticultural* uses. A technical advisory committee, comprised of professionals familiar with Virginia agriculture, was established in 1998 to provide guidance on the technical aspects of developing an appropriate methodology. The members of SLEAC have officially sanctioned the use value estimates reported in this brochure.

ROLE OF THE SLEAC ESTIMATES

Section 58.1 - 3229 of the Code of Virginia requires each participating jurisdiction's assessment office to *consider* SLEAC estimates when assessing the use value of eligible land. However, the local assessing office is not requires to use SLEAC estimates verbatim.

Under certain circumstances, adjustments to SLEAC estimates may be necessary to accurately reflect local conditions that affect the use values of eligible land parcels.

[1]Information about Virginia's Use Value Assessment Program can be found at http://usevalue.agecon.vt.edu.

TY 2008 Use Value Estimates

Tables 1 & 2 list the estimated use values of agricultural and horticultural land. These estimates are based on the capitalized net income that a *bona-fide* agricultural or horticultural enterprise located in the county could be expected to earn. These values are updated annually for public information. Note, the local assessing office can only make changes to assessed property values during a reassessment year.

Table 1 lists the estimated use value for land in *agricultural* use for each of the eight Soil Conservation Service land capability classifications. Because data on the land class composition of individual parcels is often unavailable, average use values have also been provided[2]. The average of land in classes I - IV represents the average use value of *cropland*. The average of land in classes V - VII represents the average use value of *pastureland*. The average of land in classes I - VII represents the average use value of *all agricultural land*[3].

The **without risk** estimates apply to land that is *not* at risk of flooding. *The* ***with risk*** *estimates should only be applied to land parcels that are at risk of flooding due to poor drainage that cannot be remedied by tilling or drainage ditches*.

[2]Data limitations prohibited the compuation of average use values in a few counties and in most independent cities and townships.
[3]Note. Class VIII is not considered suitable for agricultural production and is therefore not included in this average.

Table 2 lists the estimated use value of land in *orchard* use. Values are reported for both apple orchards and "other" orchards for each of the eight Soil Conservation Service land capability classifications. "Other" orchard refers to peach, pear, cherry, or plum production. Data limitations prohibit the computation of average use values for orchards.

Virginia Cooperative Extension
A partnership of Virginia Tech and Virginia State University www.ext.vt.edu

VirginiaTech Invent the Future
VIRGINIA STATE UNIVERSITY

Virginia Cooperative Extension programs and employment are open to all, regardless of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. An equal opportunity/affirmative action employer. Issued in furtherance of Cooperative Extension work, Virginia Polytechnic Institute and State University, Virginia State University, and the U.S. Department of Agriculture cooperating. Mark A. McCann, Director, Virginia Cooperative Extension, Virginia Tech, Blacksburg; Alma C. Hobbs, Administrator, 1890 Extension Program, Virginia State, Petersburg.

Appendix C
Prince Edward County: Tables 2, 3, 4, and 5

Table 2: The composite farm and average net returns in Prince Edward.

Annual net returns are determined through enterprise budgeting for crops that contributed one or more acres to the composite farm. The estimated net returns shown in the table below are "olympic" averages[1] for each crop in the composite farm for years 2000-2006.

Additional information about these estimates can be found at Virginia's Use Value Assessment Program website, http://usevalue.agecon.vt.edu.

Average net returns applicable to tax-year **2008**.

		Total Acreage[2]	Composite Farm (Acres)[3]	Estimated Net Return ($/Acre)
1.	Number of Farms 395			
2.	Corn[4]	1,430	4	$ 75.20
3.	Alfalfa	1,043	3	$ 56.52
4.	Hay[5]	12,818	32	$ 4.75
5.	Wheat	268	1	$ 152.48
6.	Barley	202	1	$ 50.56
7.	Soybeans	---	---	---
8.	Potatoes	10	0	$ 0.00
9.	Cotton	---	---	---
10.	Double-Cropped[6]	(-) 470	(-) 1	
11.	**Totals**	**15,301**	**39**	**$ 18.20[7]**

Note

n.a. = Not Applicable
D = Withheld to avoid disclosing data of individual farms.

---

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

[2] Data taken from the 2002 Census of Agriculture.

[3] Some data do not add exactly due to rounding and some categories are not listed to to disclosure rules.

[4] Corn acreage is corn-grain plus corn-silage acreages.

[5] Hay acreage is (all hay + all haylage, grass silage, greenchop) - (alfalfa hay + haylage or greechop from alfalfa or

[6] Double-cropped acreage is subtracted from the crops listed in lines 2-9 to arrive at the total cropland harvested

[7] Weighted average of crop estimated net returns by composite farm acreage.

Table 3: Worksheet for estimating the use value of agricultural land in Prince Edward.

Additional information about these estimates can be found at Virginia's Use Value Assessment Program website, http://usevalue.agecon.vt.edu/.

Estimates are applicable to tax-year **2008**.

1. Estimated net return	$18.20
2. Capitalization rates	
a) Interest rate component [1]	0.0761
b) Property tax component [2]	0.0043
c) Rate without risk	0.0805 (sum a and b)
d) Risk component	0.0040 (0.05 times 2c)
e) Rate with risk [3]	0.0845 (sum c and d)

	Without Risk [4]	With Risk [5]
3. Unadjusted Use Value	$ 226.17	$ 215.40

4. Soil Index

Land Class	Crop Acreage (No Pasture Acreage) [6]	Productivity Index	Weighted Acreage
I	418	1.5	627
II	21,273	1.35	28,719
III	10,617	1	10,617
IV	6,557	.8	6,557
Total:	40,504		46,519

Soil Index Factor [7]: 1.15

5. Agricultural use value adjusted by land class

Class	Land Index	Without Risk	Reported [8]	With Risk	Reported [8]
I	1.50	$ 295.39	**300**	$281.32	**280**
II	1.35	$ 265.85	**270**	$253.19	**250**
III	1.00	$ 196.93	**200**	$187.55	**190**
IV	0.80	$ 157.54	**160**	$150.04	**150**
V	0.60	$ 118.16	**120**	$112.53	**110**
VI	0.50	$ 98.46	**100**	$93.77	**90**
VII	0.30	$ 59.08	**60**	$56.26	**60**
VIII	0.10	$ 19.69	**20**	$18.75	**20**

[1] The 10-year average of long term interest rates charged by the various Agriculture Credit Associations serving the state.
[2] The 10-year average of the effective true tax rates reported by the Virginia Department of Taxation.
[3] Rate should only be used when the soil has poor drainage that is not remedied by tiling or drainage ditches or when the land lies in a floodplain.
[4] Estimated Net Return (Line 1) divided by Rate without risk (Line 2c)
[5] Estimated Net Return (Line 1) divided by Rate with risk (Line 2e)
[6] Data provided by the Virginia Conservation Needs Inventory (1967).
[7] Index factor = (Total Weighted Acreage) / (Total Cropland Acreage)
[8] Rounded to the nearest $10 and reported in Table 1a.

Table 4: Input costs, revenues, and net income (loss) for processed and fresh market apple production.

Per acre costs, revenues, and net income assuming a planting density of 135 trees per acre using semi-dwarf rootstock.

Estimates apply to tax-year 2008

Establishment Costs (applicable to both processed market and fresh market orchards)								
Land Clearing	$150.00							
Land Preparation (labor, machinery, material)	$550.00							
Planting (labor, machinery, trees)	$1,400.00							
Total Establishment Cost	**$2,100.00**							
	Processed Market Apple Production				**Fresh Market Apple Production**			
	Pre Production (1-4 Years)	**Early Production (5-10 years)**	**Full Production (11-25 years)**	**Late Production (26-30 years)**	**Pre Production (1-4 Years)**	**Early Production (5-10 years)**	**Full Production (11-25 years)**	**Late Production (26-30 years)**
Annual Production Costs								
Fertilizer	$87.72	$80.00	$48.96	$55.08	$87.72	$80.00	$100.00	$80.00
Lime	$52.00	$21.00	$21.00	$0.00	$52.00	$21.00	$21.00	$21.00
Pesticides	$195.99	$389.84	$584.77	$584.77	$195.99	$495.87	$734.71	$734.71
Bee Rental	$5.00	$18.00	$28.00	$28.00	$5.00	$18.00	$28.00	$28.00
Pest Control	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00
Mulch	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Pruning	$75.00	$300.00	$400.00	$400.00	$150.00	$300.00	$500.00	$400.00
Hand Thinning	$0.00	$0.00	$0.00	$0.00	$0.00	$200.00	$400.00	$300.00
Supplies (replace lost wrenches, etc.)	$8.00	$7.00	$6.00	$5.00	$8.00	$7.00	$6.00	$5.00
Miscelaneous (telephone, etc.)	$55.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00
Fixed Machinery Cost (interest & depreciation)	$35.65	$35.65	$35.65	$35.65	$35.65	$35.65	$35.65	$35.65
Variable Machinery Cost (fuel, oil, & maintenance)	$74.40	$282.00	$282.00	$282.00	$74.40	$282.00	$282.00	$282.00
Permanent Labor	$190.00	$386.00	$578.00	$474.00	$190.00	$386.00	$578.00	$474.00
Annual Harvest Cost								
Harvest Labor	$50.00	$325.00	$800.00	$600.00	$57.50	$373.75	$920.00	$690.00
Fixed Machinery Cost (interest & depreciation)	$23.00	$23.00	$23.00	$23.00	$23.00	$23.00	$23.00	$23.00
Variable Machinery Cost (fuel, oil, & maintenance)	$27.60	$96.00	$96.00	$96.00	$27.60	$96.00	$96.00	$96.00
Storage, Packing, Transportation, and Brokerage Fee	$0.00	$0.00	$0.00	$0.00	$225.00	$1,462.50	$3,560.00	$2,700.00
Annual Overhead								
Insurance	$2.50	$2.50	$2.50	$2.50	$2.50	$2.50	$2.50	$2.50
Average Interest (paid on operating capital and debt) /1/	$319.46	$785.53	$1,233.23	$1,441.60	$347.54	$1,052.29	$3,077.88	$5,887.56
Total Annual Production, Harvesting and Overhead Costs	**$1,741.32**	**$2,778.52**	**$4,166.11**	**$4,054.60**	**$2,033.90**	**$4,862.56**	**$10,391.74**	**$11,786.42**
Yield	50	325	800	600	50	325	800	600
Price Received	$5.04	$5.04	$5.04	$5.04	$9.21	$9.21	$9.21	$9.21
Total Revenue	**$252.00**	**$1,638.00**	**$4,032.00**	**$3,024.00**	**$460.50**	**$2,993.25**	**$7,368.00**	**$5,526.00**
ANNUAL NET INCOME (LOSS)	***($1,489.32)***	***($1,194.90)***	***($134.11)***	***($1,030.60)***	***($1,573.40)***	***($1,869.31)***	***($3,023.74)***	***($6,260.42)***

Table 5: Worksheet for estimating the use value of orchard land in Prince Edward.
The estimated net returns assume a planting density of 135 trees per acre. Additional information about these estimates can be found at Virginia's Use Value Assessment Program website, http://usevalue.agecon.vt.edu/.

Estimate apply to tax-year **2008**.

1. Estimated net returns (loss) per acre applicable to tax-year 2008 (see Table 4 for more detail).

	Age of Trees	Processed Fruit	% of Total [1]	Fresh Fruit	% of Total [1]
Pre-production	1 - 4 years	($1,489.32)	7.0 %	($1,573.40)	3.0 %
Early-production	5 - 10 years	($1,194.90)	17.5 %	($1,869.31)	7.5 %
Full-production	11 - 25 years	($134.11)	35.0 %	($3,023.74)	15.0 %
Late-production	26 - 30 years	($1,030.60)	10.5 %	($6, 260.42)	4.5 %

2. Weighted Average Net Return values

a)	2006 [2]	($1,390.19)
b)	2005	($565.48)
c)	2004	$14.54
d)	2003	$19.52
e)	2002	$34.64
f)	2001	($154.70)
g)	2000	($113.52)

3. Net Returns

a) Net return to "trees and land" (olympic average of 2a thru 2g) [3]	$ 6.81
b) Net return attributable to "land only" (Class III) [4]	$ 15.85
c) Net return attributable to "trees only"	($ 9.03) (3a minus 3b)

4. Capitalization Rate

a) Interest Rate [5]	0.0761
b) Property Tax [6]	0.0043
c) Depreciation of Apple Trees [7]	0.0333
d) Depreciation of "Other" Trees [8]	0.0500
e) Apple Orchard Capitalization Rate	0.1138 (sum 5a, 5b, and 5c)
f) "Other" Orchard Capitalization Rate	0.1305 (sum 5a, 5b, 5d)

5. Use Value of Apple Orchard and "Other" Orchard

		APPLE ORCHARD		"OTHER" ORCHARD	
Land Class	Orchard Index [9]	Apple Trees	Apple Trees and Land [10]	Other Trees	Other Trees and Land [10]
I	0.80	($ 63.53)	$ 231.86	($ 55.40)	$ 239.99
II	1.00	($ 79.41)	$ 186.44	($ 69.25)	$ 196.60
III	1.00	($ 79.41)	$ 117.52	($ 69.25)	$ 127.68
IV	1.00	($ 79.41)	$ 78.13	($ 69.25)	$ 88.30
V	0.75	($ 59.56)	$ 58.60	($ 51.93)	$ 66.22
VI	0.60	($ 47.65)	$ 50.82	($ 41.55)	$ 56.92
VII	0.40	($ 31.76)	$ 27.31	($ 27.70)	$ 31.38
VIII	0.00	($ 0.00)	$ 19.69	($ 0.00)	$ 19.69

[1] These percentages assume that 70% of the fruit is produced for the processed market and 30% is produced for the fresh market. In addition, it is assumed that the orchard is: 10% pre-production, 25% early-production, 50% full-production and 15% late-production.
[2] This is the average net return of the eight orchard categories listed in Section 1 of this table. The weights are provided by the percent of total trees represented by each category.
[3] In an olympic average, the highest and lowest values are dropped prior to calculating the arithmetic mean.
[4] This is determined by dividing the unadjusted net return value (Table 3 -Line 1) by the soil index factor (Table 3 - Section 4).
[5] The 10-year average of long term interest rates charged by the various Agriculture Credit Associations serving the state.
[6] The 10-year average of the effective true tax rates reported by the Virginia Department of Taxation.
[7] The depreciation rate applicable to apple trees assumes that trees are replaced on a 30-year rotation.
[8] "Other" trees refer to peach, cherry, pear, and plum trees. The depreciation rate applicable to "other" trees assumes that trees are replaced on a 20-year rotation.
[9] The orchard index is applicable only in determing the value of the trees. The land index (Table 3 - Section 5) is applied to the land.
[10] The use value of trees and land is determined by adding the appropriate without-risk land-use-value (see Table 3 - Section 5) to the use value of the trees.

Appendix D
Data Sources

To ensure the integrity of the use-value estimates, the SLEAC uses published, secondary data sources whenever possible. These secondary data generally have been collected in accordance with procedures uniformly applicable throughout Virginia. In a few instances, when published data are not available, the opinions of agricultural or horticultural professionals are solicited.

2002 Census of Agriculture

- Total number of farms in each jurisdiction, and
- Total number of acres devoted to the various crop enterprises in each jurisdiction.

Virginia Cooperative Extension

- Recommended amounts of fertilizer and seed for each crop,
- Recommended number of custom applications,
- Seed, fertilizer, and chemical prices, and
- Machinery costs.

Farm Service Agency

- Federal Agricultural Marketing Transition Act payments made in each jurisdiction, and
- The price of lime in each jurisdiction.

Conservation Till Institute

- Percentage of land in conventional and reduced till for each crop in each jurisdiction.

AgFirst

- Long-term interest rates used for the interest-rate component of the capitalization rate, and
- Short-term interest rates used for calculating interest on production capital.

Federal Crop Insurance Corporation

- Insurance premiums, subsidies, and indemnities made in each jurisdiction to each crop.

Market News

- Regional prices received for barley, corn, wheat, and soybeans.

Virginia Agricultural Statistics

- Average farm wages and
- Prices received for alfalfa, hay, tobacco, cotton, peanuts, and potatoes.

Virginia Crop Reporting Service

- Crop yields.

Virginia Conservation Needs Inventory

- Total acreage of each land class in each jurisdiction.

Virginia Department of Taxation

- Property tax component of the capitalization rate.

2008

PUBLICATION 446-011

www.ext.vt.edu

Produced by Communications and Marketing, College of Agriculture and Life Sciences,
Virginia Polytechnic Institute and State University

Virginia Cooperative Extension programs and employment are open to all, regardless of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. An equal opportunity/affirmative action employer. Issued in furtherance of Cooperative Extension work, Virginia Polytechnic Institute and State University, Virginia State University, and the U.S. Department of Agriculture cooperating. Mark A. McCann, Director, Virginia Cooperative Extension, Virginia Tech, Blacksburg; Alma C. Hobbs, Administrator, 1890 Extension Program, Virginia State, Petersburg.

VT/0208/W/446011