NEW JERSEY

APPRAISER HANDBOOK SUPPLEMENT

PINELANDS AREA
AND
AGRICULTURAL USE APPLICATIONS

Acknowledgements

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FORWARD

Arthur E. Clapp, ARA of CLAPP APPRAISALS was retained by the SADC to provide assistance to the State Agriculture Development Committee ("SADC") in establishing procedures or guidelines for valuing the fair market value of the fee simple estate of farmland in the pinelands.

Early in the process of developing these guidelines, it was recognized that a substantial book of knowledge pertinent to valuation, land valuation, and rural valuation exists within the appraisal profession. The author of this handbook concluded, therefore, that this assignment should not "reinvent the wheel"; rather it should provide supplemental guidance to appraisers that would be useful in valuing lands in the pinelands region.

Users of this handbook supplement should be aware that it is complimentary to other published data. Appraisers of rural property in the pinelands should have in their personal libraries, and be familiar with, the following publications:

- *The Appraisal of Real Estate, 11th Edition (Chicago, Appraisal Institute, 1996)*
- *The Appraisal of Rural Property, Second Edition (Chicago, the American Society of Farm Managers and Rural Appraisers and the Appraisal Institute, 2000)*
- *New Jersey Farmland Preservation Program, Appraiser Handbook (New Jersey, SADC, 2000)*

The handbook supplement that follows builds on these three documents and focuses valuation guidance toward the appraisal problems typically confronted in the pinelands.

The basic tenants of valuation are found in the Eleventh Edition of The Appraisal of Real Estate. These principles are fundamental to valuation and do not change, even when applied to a broad array of property types.

The Appraisal of Rural Property, Second Edition builds on the basic tenants and serves to focus the appraiser on the nuances of valuing rural properties.

The New Jersey Appraiser Handbook provides direction to appraisers employed by the State and/or County Agriculture Development Committees based on the basic tenants found in the aforementioned publications.

The handbook supplement that is contained in the following document takes these three, well-written documents and focuses the appraiser on the requirements of completing valuations on agricultural properties in the pinelands. The information contained in the document should also prove useful to those appraisers valuing properties with a highest and best use for agriculture outside the pinelands, the so-called restricted farm properties.

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OVERVIEW

The Agriculture Retention and Development Act of 1983 provides the basis for the public purchase of development easements on farmland in New Jersey. The State Agriculture and Development Committee, (SADC) created by the Right to Farm Act, is responsible for administering the Farmland Preservation Program. The SADC is in, but not of, the Department of Agriculture. Chaired by the Secretary of Agriculture, it consists of 11 members who represent the State and general public's agricultural, fiscal, community and environmental interests.

The public has supported farmland preservation efforts through the passage of the Farmland Preservation Bond Act of 1981, Open Space Preservation Bond Act of 1989, the Green Acres, Clean Water, Farmland and Historic Preservation Bond Act of 1992 and the Green Acres, Farmland and Historic Preservation and Blue Acres Bond Act of 1995. Combined, the four bond acts provided $200 million for farmland preservation purposes.

For State fiscal year 1999, $25 million was provided to the SADC from general funds to ensure a continuation of the program until the stable source of funding provided by the Garden State Preservation Trust Act, P.L. 1999, c. 152 was available.

In November 1998, the public supported a constitutional amendment to dedicate $98 million annually from the State General Fund to provide a stable source of funding for farmland, open space and historic preservation. The Garden State Preservation Trust Act, P.L. 1999, c. 152 establishes the framework for open space preservation, farmland preservation, recreation and park development and historic preservation through state fiscal year 2009. Furthermore, the Act stipulates that the SADC will receive 40% of available funds for farmland preservation purposes. It is anticipated that the $98 million will be leveraged to provide approximately $64 million for farmland preservation purposes annually for a period of 10 years. The Act also provides for the creation of the Garden State Preservation Trust and authorizes moneys appropriated from the Garden State Preservation Trust Fund to the SADC to:

- Provide grants to local government units to pay up to 80% of the cost of acquisition of development easements on farmland, and to qualifying tax-exempt nonprofit organizations to pay up to 50% of the cost of acquisition of development easements on farmland;

- Provide grants to local government units to pay up to 80% of the cost of acquisition of fee simple titles to farmland from willing sellers only, and to qualifying tax-exempt nonprofit organizations to pay up to 50% of the cost of acquisition of fee simple titles to farmland from willing sellers;

- Pay the cost of acquisition by the SADC of development easements on farmland; and

- Pay the cost of acquisition by the SADC of fee simple titles to farmland from - willing sellers only, which shall be offered for resale or lease with agricultural deed restrictions.

Under the authority of P.L. 1999, c. 180, the SADC may provide planning incentive grants for the purchase of development easements on farmland to eligible counties and municipalities. The objective of the program is to preserve significant areas of reasonably contiguous farmland that will promote the long-term viability of agriculture as an industry.

To date, the majority of landowner participation has been through the Easement Purchase Program whereby landowners sell the development rights on their land to the County Agriculture Development Board (CADB). Compensation for this sale is based on the appraised value of the development rights on the land. The landowner retains ownership of the land and is eligible for certain benefits and protections.

The voluntary sale of a development easement or rights by a landowner results in the placement of a permanent deed restriction on the preserved property, prohibiting any future nonagricultural development. It does not prohibit such estate/recreational pursuits as are listed in the deed restrictions. The program is entirely voluntary both on the part of the landowner (i.e. seller) and the municipal/county/state governments (i.e. buyer). Eminent domain and condemnation do not have a role in this program.

PROGRAM PROCEDURES FOR THE PURCHASE OF DEVELOPMENT EASEMENTS

The Easement Purchase Program in the past has operated on an annual basis. For the 2000 funding round, there were two application rounds. The first application round (2000 A) required the submission of completed appraisals to the State Agriculture Development Committee on or before January 15, 2000. The second application round (2000 B) required the submission of completed appraisals to the State Agriculture Development Committee on or before March 21, 2000. It is anticipated that there may only be one application funding round for 2001. A final determination will be made by the SADC based upon application demand and funding availability.

The general easement purchase process is summarized below:

1. The landowner applies to the County Agriculture Development Board (CADB) to sell a development easement.

2. The CADB must review, evaluate and approve the easement purchase based on its criteria. Municipal approval is also required for the purchase of a development easement.

3. The CADB shall contract with two independent appraisers approved by the State Agriculture Development Committee (SADC) to conduct an appraisal of each of the approved farms. This will be a complete self-contained report estimating the "Before" and "After" values of only the land with a brief description of the improvements, if any.

4. The CADB shall submit a request for a grant to the SADC for the purchase of a development easement on approved farms on or before the date appraisal work is authorized. The SADC has not limited the number of easement purchase applications a CADB can submit to the SADC for the 2001 funding round, pursuant to N.J.A.C. 2:76-6.1 1 (a). The Committee will establish a preliminary ranking of the applications based on the applicant's quality score derived from criteria contained in N.J.A.C. 2:76- 6.16.

5. The CADB is fully responsible for authorizing and securing the appraisals. All appraisal valuations shall be conducted with an as of date of September 1 of each year and estimate a marketing time of the subject of one - two years.

VALUATION OF FARMLAND IN THE PINELANDS

Pursuant to the Garden State Preservation Trust Act, whenever the value of a development easement on farmland to be acquired using constitutionally dedicated moneys in whole or in part is determined based upon the value of any pineland development credits allocated to the parcel pursuant to P.L. 1979, c.111 (C.13:18A-1 et seq.) and the pinelands comprehensive management plan adopted pursuant thereto, the SADC shall determine the value of the development easement based on the following:

1. Conducting a sufficient number of fair market appraisals as it deems appropriate to determine the value for farmland preservation purposes of the pinelands development credits;

2. Considering development easement values in counties, municipalities, and other areas (1) reasonably contiguous to, but outside of, the pinelands area, which in the sole opinion of the SADC constitute reasonable development easement values in the pinelands area where pinelands development credits are or may be utilized, which in the sole opinion of the SADC constitute reasonable development easement values in the pinelands area;

3. Considering values in the pinelands regional growth areas;

4. Considering the importance of preserving agricultural lands in the pinelands area; and

5. Considering such other relevant factors as may be necessary to increase participation in the farmland preservation program by owners of agricultural lands located in the pinelands area.

On February 22, 2001, the SADC adopted new rules at N.J.A.C 2:76-19, Valuation of Development Easements in the Pinelands Areas to implement the provisions of the Garden State Preservation Trust Act. The new rules are expected to become effective upon publication in the New Jersey Register on April 2, 2001. A copy of the adopted new rule is available upon request from the SADC.

Pursuant to N.J.A.C. 2:76-19.3, development easement values shall be valued by adjusting the base value of the easement in accordance with N.J.A.C. 2:76-19.4 pursuant to the factors set forth in the rule, (N.J.A.C. 2:76-19.5 through 19.13). Pursuant to N.J.A.C. 2:76-19.14, the valuation of a development easement shall not exceed 80 percent of the fee simple market value of the property as determined by the SADC.

This document provides guidance and procedure for Real Property Appraisers to follow when valuing the fee-simple estate(s) of property located within the pinelands area, specifically for those properties located within an Agricultural Production Area, Special Agricultural Production Area, or Preservation area in the pinelands. The valuation procedures ***shall not apply*** to any lands from which pinelands development credits (PDC's) have already been severed.

APPRAISERS

Approved Appraisers: Appraisers authorized to conduct appraisals of farms must be approved by the State Agriculture Development Committee and re-certified every year. Inclusion on the SADC approved appraiser list applies to individual appraisers only, not to entire appraisal firms. Appraisers must, at a minimum, be State Certified General Real Estate Appraisers and present evidence of current state certification at the time of application and/or re-certification.

Approved appraisers should have demonstrated competency in the valuation of rural and agricultural properties. USPAP has viewed competency to be important enough in valuation procedure to include within the USPAP document the "Competency Rule" (USPAP 2001 Edition, The Appraisal Foundation, Page 9). The Competency Rule requires that "Prior to accepting an assignment or entering into an agreement to perform any assignment, an appraiser must properly identify the problem to be addressed and have the knowledge and experience to complete the assignment competently…"

Competency applies to factors such as, but is not limited to, an appraiser's familiarity with a specific type of property, a market, a geographic area, or an analytic method. In rural and agricultural valuation, the markets are often specialized; the geographic areas often more widely dispersed than those of other property types, and analytic methods have been formulated over time that apply specifically to rural and agricultural property types. An appraiser must be familiar with the latest doctrine applicable to rural valuation, and must be familiar with the market forces – including local, regional, national, and international forces – that impact the industry in which the property being valued is a part.

Approved appraisers should submit to the CADB and the SADC evidence of their experience and education in valuing rural and agricultural properties. Courses and seminars are offered regionally and nationally by recognized professional organizations. The leading rural appraisal professional organization is The American Society of Farm Managers and Rural Appraisers (ASFMRA). Formed in 1929, it is the oldest professional appraisal association in the U.S. It is a charter sponsor of the Appraisal Foundation and has been recognized by such groups as the Appraisal Institute (AI), the American Society of Appraisers (ASA), and the Appraisal Institute of Canada (AIC) as the leading representative of rural appraisers and farm managers in North America.

Educational offerings through the ASFMRA include so-called "core" courses (A-10, Fundamentals of Rural Appraisal; A-20, Principles of Rural Appraisal; A-30, Advanced Rural Appraisal), Advanced Rural Case Studies, A-40, and numerous seminars including: Advanced Sales Confirmation; Cold Storage & Packinghouse Valuation; Cost Approach; Conservation Easements; Environmental Issues Affecting Real Property Appraising; Appraisal Issues and Applications; GIS Mapping in ArcView Workshop; Income Approach; Permanent Plantings Appraisal; Appraising Permanent Plantings in Changing Markets; Rural Business Valuation; Sales Analysis; Sales Comparison Approach; Soil and Water Conservation; Special Purpose Structures; Statistics; and Timber Valuation. Other educational offerings are available through the ASFMRA chapters located around the U.S. and at its summer and annual meeting sites.

Some appraisers specializing in rural properties have been trained through work experience. Many have professional experience gained through employment in lending – primarily the Farm Credit Service; the USDA/FmHA or USDA/FSA; Insurance industry lending; and/or community banking with an emphasis on agricultural lending. Other types of experience and education pertinent to rural valuation include: work experience with agricultural colleges, vocational agricultural schools, extension service, and farm employment.

The SADC and CADB should require that applicants for consideration as approved appraisers demonstrate satisfactory completion of education that is provided by, or equivalent to that approved as rural appraisal education by The Appraisal Foundation's Appraisal Qualifications Board (AQB) and/or the State of New Jersey Real Estate Appraiser Board. A listing of those approved courses is available from The Appraisal Foundation or through the NJ Department of Law & Public Safety, Division of Consumer Affairs.

The SADC and CADB should give serious consideration to requiring submission of a minimum of two (2) sample appraisal reports from each appraiser requesting to become approved

appraisers. The sample appraisals should be completed on properties that are similar to those which will be valued in the program. For example, if an appraiser is going to be valuing permanent plantings, sample reports should be reflective of permanent planting appraisals; if an appraiser is going to be valuing cranberries and blueberries, sample reports should be reflective of cranberry and blueberry appraisals.

Sample reports serve two functions. First, they provide an evaluation tool for the selection of approved appraisers. The submitting appraiser will likely provide samples of a work product that meets or exceeds requirements in order to favorably impress the officials who will be making the decision to retain appraisers. Therefore, the CADB and SADC should be in receipt of the appraiser's "best" efforts. The CADB and SADC can, therefore, evaluate the application of appraisal methodology and its appropriateness for rural properties.

Second, the sample report serves as a quality control tool. After review and acceptance by the CADB and SADC, the report should be retained. Going forward it can serve as the standard of acceptance from the appraisers. The CADB and SADC should expect that all reports submitted by the appraiser would meet or exceed the quality of the sample report. This in itself could serve to increase appraisal quality for the program.

Contracting With Appraisers: The County Agriculture Development Board ("CADB") shall be responsible for contracting directly with two independent fee appraisers for each transaction. The contract should stipulate compliance with the SADC's Appraisal Handbook, the SADC's Pinelands Area and Agricultural Use Applications supplement, the Uniform Standards of Professional Appraisal Practice ("USPAP"), and the Uniform Standards for Federal Lands Acquisition ("USFLA") as well as any supplemental standards and specifications required by the CADB. It is recommended that the type of appraisal process (Complete or Limited), type of appraisal report (Self-Contained or Summary), number of copies to be delivered, amount and structure of fee, and a completion date be specified in any engagement letter/contract entered into by the CADB.

In order to speed the review process and ensure consistency each appraiser must use the same acreage for the property being valued. The CADB, in its engagement letter/contract should specify the acreage to be used. Acreage should be provided for the total property and for the property's use: i.e., the amount of the property that is tillable (irrigated and/or dry land); the amount of the property that is pasture; the amount of the property that is permanent plantings (orchard, vineyard, blueberries, and/or cranberries); the amount of the property that is comprised of wetlands (hydric soils); the amount of the property that is used for water storage/supply (for cranberries and irrigated property); and the amount of the property that is woods, waste, and roads. If the appraiser, during the valuation process notices differences in size and/or acreage, he/she should notify the CADB and request a clarification/ruling as to the acreage(s) to be used in the valuation. The CADB will provide any clarifications or adjustments in acreage to both appraisers to ensure consistency.

A written engagement letter/contract is required for the protection of both the CADB and the appraiser. The CADB should provide the appraisers with as much information as possible in order that informed bids for appraisal services can be formulated.

APPRAISALS

(a) **Wetlands**: The CADB should provide the appraisers with a copy of the State Wetlands maps or a portion thereof for the subject property. The degree of detail of the wetland analysis on the subject and the comparables should reflect the importance of wetlands to the overall value. The Appraiser shall include as an exhibit in appraisals copies of soil maps for each property valued and a description of soils, including wetlands, for each subject property and comparable sale. Consideration shall be given to the type of wetlands (i.e. modified agricultural, etc.), the amount of wetlands as a percentage of total area, whether the wetlands can be used to compute the number of residences allowed for development, or for the calculation of PDC's, and any other factors of significance.

(b) **Pre-existing nonagricultural uses**: Any pre-existing nonagricultural uses identified in the SADC's "Application For An Easement Purchase Cost Share Grant" must be noted in the appraisal report. The appraiser must determine if there is an effect on the development value if the existing nonagricultural use is permitted to continue after the placement of a Conservation Easement (in the "After" situation).

(c) **Other**:

The appraisal report must:

1. Be written; it may be presented in a narrative format substantially conforming to the format included in the most recent edition of the New Jersey Farmland Preservation Program Appraiser Handbook;

2. Be sufficiently descriptive to enable the reader to ascertain the estimated market value and the rationale used to develop the opinion;

3. Be sufficiently detailed in Highest and Best Use Analysis to enable the reader to ascertain that the Use conclusion is adequately supported. If agricultural use is concluded as the Highest and Best Use of the property, this section should also include a determination of the type of agricultural use that the property is suited for i.e., cranberry, blueberry, peaches, vegetables, field crops, etc.

   If the Highest and Best Use is determined to be an agricultural use, sufficient analytical detail must be included to support the conclusion, including detail supporting the type of agricultural use;

4. Provide detail and depth of analysis that reflect the complexity of the real property appraised;

5. Analyze and report in reasonable detail the most recent transfer of the subject property, regardless of sale date, and any prior sales of the property being appraised that occurred within five (5) years preceding the effective date of the appraisal report or the date of the appraisal report preparation, whichever is the longer time period;

6. Analyze and report on current market conditions and trends to the extent they affect the value of the subject property; and

7. Analyze and report in reasonable detail any contracts of sale on the subject property, adhering to the spirit and letter of Advisory Opinion Number 1 found in USPAP.

MARKET VALUE

Market value is the major focus of most real property appraisal assignments. Both economic and legal definitions of market value have been developed and refined. The following definition of Market Value should be used in the valuation of fee-simple interests in the pinelands area.

> The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:
>
> - Buyer and seller are typically motivated;
> - Both parties are well informed or well advised, and acting in what they consider their best interests;
> - A reasonable time is allowed for exposure in the open market;
> - Payment is made in terms of cash in United States dollars or in terms of financial arrangements comparable thereto; and
> - The price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.[1]

The above definition is very similar to that found in FDIC 323.2(f). That definition was developed by the Federal National Mortgage Association ("Fannie Mae") and is widely accepted by mortgage lenders and many government agencies.

VALUATION METHODS AND STANDARDS

The appraisal reports prepared for use by the SADC will be subject to a minimum of one level of professional review by a designated review appraiser. In addition, all reports are subject to peer review by professional associations, in accordance with the association's peer review policy, and review requirements that may be imposed by State of New Jersey Appraiser certification and/or licensing requirements.

[1]USPAP 2001 Edition, The Appraisal Foundation, Glossary, page 199

All appraisal reports completed for use by the SADC must be completed in accordance with the following standards:

- State of New Jersey Appraisal Standards (New Jersey Farmland Preservation Program, Appraiser Handbook June, 2000 and the guidelines included in this supplement)
- Uniform Standards of Professional Appraisal Practice (Current Edition)
- Uniform Appraisal Standards for Federal Land Acquisition (Current Edition) (If Applicable)

The appraisal reports that are submitted must meet the requirements outlined in USPAP Statement 7. If the appraisal submitted is a Limited Appraisal, the appraiser must include detail as to the extent of departure and the reason(s) for invoking the Departure Rule of USPAP.

Appraisal reports submitted to the SADC can be either Self-Contained or Summary Appraisal Reports (USPAP AO-11; AO-12). Limited Use Reports are unacceptable for submission. All reports shall be in a full narrative format and shall be prepared in accordance with the format required by the SADC.

PROPERTY INSPECTION

The Appraiser shall invite the landowner or his/her representative to accompany him/her during inspection. The invitation to participate shall be extended to the landowner in writing with a copy of the document, signed by the landowner or his/her representative included as an exhibit to the report. A copy of an acceptable invitation document is included as an exhibit to this document.

APPRAISAL REPORT FORMAT

Each Report must conform to the requirements as set forth in the most recent edition of the ***NEW JERSEY FARMLAND PRESERVATION PROGRAM APPRAISER HANDBOOK***. The following formatting requirements are supplemental standards to be followed in the valuation of any property for which the highest and best use has been determined to be agricultural in nature.

1. Each report shall contain a section, typically included as part of the Community and Neighborhood Data section, that offers a full discussion of agriculture in the region and community and the trends evident in agricultural production including, but not limited to: product prices; yields; soil resources; infrastructure, including suppliers, markets, and other support services; competing and/or complimentary agricultural uses; trends in the industry, past and potential future trends; etc.

2. Appraisers must discuss the attributes of the property being valued with an emphasis on its suitability for agriculture including, but not limited to: configuration, field size/utility, discussion of use and acreage devoted to uses (i.e. acres of tillage, acres of permanent plantings, acres of pasture, etc.) Soils (Include a chart similar to the following)

Chart 1

Soil Type	Area (%)	Septic Limitations	Quality	Capability Subclass
CnB	25%	Severe	Prime	IIe
CnD3	26%	Severe	Other	IVe
CnC2	13%	Severe	Prime	IIIe
HnB	11%	Severe	Prime	IIw

	Area	Prime Farmlands	Statewide Importance	Other
Total	75%	78%	0%	15%

Irrigated Tillage (%)	Dry Land Tillage (%)	Permanent Plantings (%)	Pasture (%)	Woods/Waste/Other (%)
10%	50%	25%	10%	5%

3. It is not uncommon for agricultural lands to include certain improvements. These may include: irrigation, drainage, building improvements, or permanent plantings. The appraiser must consider the contribution of the improvements, or the lack of required improvements, whenever reporting a value conclusion. In accordance with USPAP, if personal property (equipment such as irrigation systems) is included in a property value, its contribution must be reported, described and commented on (USPAP Std. Rule 1-2(e)(iii))

6. Public Land Use regulations including zoning and any applicable comprehensive plans must be addressed in a detailed summary. The impact on property use resulting from the Pinelands Management Plan and locating the property being valued in the appropriate area i.e., Pinelands Preservation Area, Agricultural Production Area, or Special Agricultural Production Area is required. Included in the discussion should be comment on the Status of Development Credits (PDC's) on Subject property.

7. The adjustment grid found on page 24 of the handbook provides Qualitative Adjustments. An adjustment grid similar to that found as an Exhibit to these guidelines can be used when using Quantitative adjustments. Regardless of which type of adjustment is used, the grid should provide for land balance and mix and improvements (if required) adjustments similar to those described in these guidelines.

8. Exhibits and/or Addenda that must be included are:
    1. Plot plan of subject including relative location of improvements, and, if a permanent planting, the location of plantings by variety and age of planting if available
    2. Aerial Photograph of Property showing location and area of tillable lands
    3. Other pertinent exhibits, such as:
        a. Fruit Supplement forms
        b. Timber cruises
        c. Land planning report
        d. Other similar data

Maps and plans can be included in the body of the report either on pages opposite the description, tabulation, or discussions they concern, or imbedded within the text as graphics presentations.

The contracting entity, either the County Agricultural Development Board or the State Agricultural Development Committee, will provide the appraiser with some of the factual information required for the appraisal, including:

- The stated purpose, intended use, and intended users of Appraisal. (See USPAP 2001 SR2-2 (a), (b), & (c)(v); SR 2-2(a), (b) & (c)(ii); SR2-2 (a) & (b)(i)&(b)(ix))
- A copy of the deed, plan, and/or certificate of title
- Ownership of the Property being valued
- An aerial photograph of the Property being valued
- A summary of land use for the property being valued, including the number of acres devoted to various land uses including tillage, irrigated tillage, pasture, woodland, forestry, blueberry production, cranberry production, orchard production, etc.
- A soils map of the property being valued
- A summary of the soil types including the soils designation as a prime or important farmland

VALUATION OF RURAL PROPERTY

An appraisal necessarily requires three major activities:

1. Collection of Pertinent Data;
2. Inspection of the subject property, the area of the subject property, the neighborhood of the subject property, and comparable sales; and
3. Organization and analysis of the data collected to arrive at a value opinion for the subject property.

The appraiser must understand the appraisal problem before a planned work schedule can be completed. The appraiser must answer the following questions:

1. Does the assignment require the assistance of experts from other fields – i.e. soil scientists, engineers, etc?
2. Can the appraiser alone complete this assignment or will assistance from other appraisers or staff be required to complete the project.

Although others may be involved in the appraisal process, the appraiser must remember that he/she bears the ultimate responsibility for the research, the analysis, and the report of the value conclusion.

Rural Property Rights and Interests

A thorough understanding of the property rights to be appraised is essential to proper valuation.[2] Rural land is seldom held in fee-simple. An estate may be subject to access easements, utility easements, mineral reservations, or other encumbrances. In defining the estate valued, the appraiser should exercise caution.

Possession of a title in fee establishes the fee-simple estate, i.e., absolute ownership unencumbered by any other interest or estate, subject only to the limitations imposed by the governmental powers of taxation, eminent domain, police power, and escheat. Because the appraiser is usually not valuing the fee-simple estate in agricultural properties, a conditional statement explaining the estate valued is often required.

The comparable sales used to value a property should reflect the same or similar estates. In some instances, rights may not be included in the estate appraised, but these missing rights may have little or no value, i.e., they do not contribute to property value in the context of the highest and best use of the property. The appraiser has the job of determining which rights contribute to value and the extent to which they contribute (how much value they add).

2 A thorough discussion of this topic can be found in The Appraisal of Rural Property, Second Edition (Chicago, American Society of Farm Managers and Rural Appraisers and Appraisal Institute, 2000; The Appraisal of Real Estate, 11th edition (Chicago, Appraisal Institute, 1996)

Participants in today's rural real estate markets are aware of the ways in which supply and demand influence both the number of offers for a property and the desirability of the products produced on a property. Similarly, buyers and sellers compare one offer or sale to another offer or sale to form opinions of the relative worth of individual parcels on the market.

The factors that are considered and evaluated by market participants can be generally described in relation to the use of the property in question. This analysis of use draws upon all concepts, principles, forces, and factors that influence value. An analysis is performed to develop a complete understanding of market behavior and how it relates to specific properties, a group of properties, or an area.

Type of Agriculture

The type of agriculture may directly affect farmland values by its influence on the regularity and amount of net farm income that is generated. In general, the most stable types of farming with the lowest operating risk are those in which there is a relatively wide margin between income and costs. They are usually found where stable crops or livestock are produced, the seasonal conditions are reasonably uniform, and the markets are stable.

Most specialty crops lack the characteristic of a relatively stable price, and some staple crop areas lack uniformity of production. This is particularly evident in areas dominated by one particular crop where adverse weather conditions may result in low-income levels for a particular crop season. The production of intensive specialty crops such as some truck and fruit crops is ordinarily accompanied by considerable operating risk. In some areas there is likely to be considerable variation in yields and production, and prices may fluctuate significantly from year to year. Costs are usually high relative to gross income with the result that in a year of low prices, or low yields, expenses may be greater than total income.

Some types of farming maintain or even increase soil fertility levels. This is accomplished through effective use of crop rotations, cover crops, commercial fertilizers, livestock operations, or a combination of two or more methods. Other types of farming such as continuous cropping with little or no fertilization will eventually result in the depletion of valuable fertility. Soils with a tendency toward erosion under continuous tillage make this factor more serious than it would be if a crop rotation were implemented as part of the farming practices.

Distribution of income throughout the crop year may have a direct impact on the general desirability and value of a property. As an example, specialty crop farms may have their entire year's production sold within a relatively short period of time (i.e., blueberry harvest is during a relatively short period extending only about 35 to 40 days in the late spring and early summer and cranberry harvest is concentrated during the month of October). A general farming operation, or one with several crops is likely to have income spread more evenly throughout the year.

The products grown and the acreage devoted to each commodity in the farming operation must be considered. It is the appraiser's responsibility to estimate the use of a farm property over an extended time, sometimes including estimates of future use taking into consideration any

prescribed policy affecting acreage limitations (i.e., implementation of production restrictions or "set asides" through the Cranberry Marketing Order).

Estimates of yields should reflect what might be reasonably anticipated over a period of time into the future, assuming typical operation of the property. In making these estimates, the appraiser must assume the type of operator which a particular property may attract; the yields that would be generally expected on the property given its soils, climate, location, etc.; and the likely prices of the commodity given the anticipated conditions. If technological or marketing changes indicate that higher, or lower, yields and/or prices will be reasonably anticipated, the appraiser must reflect these changes in the valuation of farm properties.

Markets and Marketing

Marketing has been defined as all the services and processes that are involved in getting a product from the hands of the producer into the hands of the ultimate consumer. The principal considerations in marketing for the appraiser included: adequacy, dependability, stability, and those marketing costs that the producer typically absorbs.

The adequacy of markets is closely related to the nature of the product. In general there is always a market for staples such as grains, corn, and livestock and livestock products. They are sold on organized commodity exchanges; and futures markets have been developed for some of the major grain commodities. The prices of staple crops have become more stable and less subject to fluctuations that are typical in fruit, vegetable, and other specialty agricultural product markets.

Many agricultural products can be produced for either the fresh market or for the processing market (cranberries, fruits, blueberries, vegetables, etc.). The demands of each market are specific and distinct. For example, the fresh market usually equates bigger with better. Therefore, a grower producing for the fresh market may thin the fruit to increase its size (usually using chemical thinning agents). This grower may be more quality conscious and has higher operating expenses than the grower aiming for the processing market. Fresh market prices are usually higher than those obtainable in the processing market. Harvest costs are usually lower for fruit grown exclusively for processing.

The fresh market may demand and require cold storage facilities. Since field heat must be removed from the product as soon as possible to extend its shelf life, the availability of nearby storage facilities is important. Some growers may have onsite storage facilities, and some fresh fruit enterprises are completely integrated with storage facilities, packing lines, and shipping facilities.

Fruit processing facilities should be located relatively close to the producer. Soft fruits are particularly susceptible to damage from long and rough hauling, which may cause them to lose grade. Some growers may produce products and/or fruit that are both fresh and processed. Production may be graded by quality or size for combination use. For example, a pear orchard may grow Bartlett pears for processing and Bosc and D'Anjou pears primarily for the fresh pear market. Bosc and D'Anjou pears that fail to reach market quality may be sold for processing.

Some growers, primarily in suburban locations, operate successful pick-your-own orchards and/or have on-farm markets. Prices for fruit on the trees may be higher, lower, or approximately equal to contract and wholesale prices in the area. But, by avoiding harvest costs (in pick-your-own operations), a grower can usually sell produce to be picked by the consumer for less than the contract price.

It is important for the appraiser to recognize the type of marketing being utilized in the area and on the property being valued. This is especially important in determining product prices for application in the income approach to value. The value opinion will be significantly influenced if processing prices were used to value a fresh produce farm or vice-versa. Similarly, expense levels will be different for different types of marketing methods.

Highest and Best Use Analysis

Analyzing the highest and best use of a rural property may be as simple as understanding a local market and then reporting one's observations, or it may require specific and detailed study of the market area and all the forces that influence it. The primary determinant of the scope and depth of analysis is the nature of the valuation assignment. A feasibility study of an agricultural tract in a transitional or suburban market may require a significant amount of time and analysis, while estimating the use of a pasture tract in an area dominated by similar uses may be significantly simpler.

Highest and best use is influenced by market participants, but is shaped by the market and market forces. Competitive economic and social forces within the market in which the property is located must be considered to effectively estimate highest and best use. Therefore, it can be said that an analysis of a rural property's highest and best use is truly a property-specific economic study of market forces.

To consider a property's highest and best use, the motivations of market participants – both buyers and sellers – must be addressed. In residential markets, real estate is purchased for occupancy and personal use; a buyer's motivation can be described as the desire to acquire the non-monetary benefits of personal and aesthetic enjoyment. The purchasers of investment property are considered motivated by the potential for future monetary benefits (accumulation of net income), for the accumulation of capital, or for tax benefits or advantages.

In rural markets, similar conclusions can be drawn. The buyers of rural residences may be motivated by the desire to benefit from aesthetics and a lifestyle that is not typically measured in monetary terms. Purchasers of income-producing rural lands, including farms and permanent plantings, are much like their commercial, industrial, and retail investment counterparts – they are motivated by the anticipation of future monetary benefits. They are primarily interested in the feasibility of the farming enterprise that is being purchased.

In completing the analysis of highest and best use, the following questions must be answered.

- What uses are legal?
- What uses are physically possible?
- Of the legally permissible and physically possible uses, which are financially feasible and will result in a sustained positive net income or will provide desired nonmonetary benefits?
- Of those legally permissible, physically possible, and financially feasible uses, which use results in the greatest level of net income or desired nonmonetary benefits thereby resulting in the greatest level of value for the property?

The analysis of highest and best use of transitional or suburban properties requires extreme caution. In the comprehensive planning process, it is not unusual for authorities to use zoning regulations to designate areas for specific use. Often, portions of communities or municipalities are designated as open-space, residential, industrial, commercial, an/or retail zones. The zones typically are arranged to promote controlled growth of the community or region. The appraiser must not assume that a tract located in an area with so-called preferred zoning – i.e., retail or business versus agricultural or residential – automatically has a higher use and therefore a higher market value.

The use of a rural property on the date of inspection may or may not be an indication of its highest and best use. The land may be suited to a more or less intensive use. The property may be best used as the site of a highly developed blueberry farming operation while the current use is for pasture. Similarly, although a tract may contain a significant amount of highly erodible land (HEL) and be best suited for pasture, it may be tilled and currently in use as cropland.

Legally Permissible Uses

The first question in the analysis of highest and best use has the most import in the Pinelands Region. The Pinelands Management Plan strictly regulates use of property in this region. The appraiser must be fully familiar with the Pinelands Management Plan and the allowed uses for the zone(s) in which the property being valued is located. An appraiser does not have to address all of the legally permitted uses of a property, but it is inappropriate to proceed with a highest and best use analysis if the implied or proposed use is illegal (i.e., subdivision of a property when the Pinelands Management Plan expressly prohibits such uses).

The appraiser must clearly document the influence of legal factors in the highest and best use analysis. If appraisers feel that they lack the competency to understand or interpret these factors, professional assistance should be obtained. In the Pinelands, the Pinelands Commission located on Springfield Road, New Lisbon, N.J. has a staff that can provide detailed information about the

Pinelands Management Plan and how it may impact a particular parcel. They can be a significant source of data regarding the legal uses of a property being valued, or of sale properties that are being considered for the comparative process.

A title search for deed restrictions and/or covenants should be made to ensure that there are no legal restrictions on property use in the chain of title. There may be conservation easements placed on the property (or portions of the property) or restrictions on development.

Some common restrictions and/or covenants applicable to rural property include:

- Transfer of development rights, or transfer of development credits in the Pinelands area;
- Life estates
- Conservation easements
- Restrictive covenants (e.g., "for agricultural production not to include livestock raising and/or production"); and
- Downzoning.

The most significant legal consideration in the Pinelands is the Pinelands Management Plan and its assignment of Pinelands Development Credits ("PDC") (Pinelands Management Plan, Part IV). The PDC's are assigned in the Pinelands according to district. The districts that are considered in these guidelines include the Preservation Areas, the Agricultural Production Areas, and the Special Agricultural Production Areas PDC's are assigned in these areas as follows:

1. Preservation Area District (Pinelands Management Plan 7:50-5.43)
    i. Undisturbed uplands or uplands approved for resource extraction– 2 PDC/39 Ac
    ii. Mined uplands – 0 PDC/39 Ac
    iii. Other uplands – 1 PDC/39 Ac
    iv. Wetlands – 0.2 PDC/39 Ac

2. Agricultural Production Area and Special Agricultural Production Area (Pinelands Management Plan 7:50-5.43)
    i. Undisturbed uplands or uplands approved for resource extraction– 2 PDC/39 Ac
    ii. Uplands mined as a result of a resource extraction permit approved pursuant to the Pinelands Management Plan – 0 PDC/39 Ac
    iii. Other uplands and areas of active berry agricultural bogs and fields – 2 PDC/39 Ac
    iv. Wetlands in active field agricultural use currently and as of February 7, 1979 – 2 PDC/39 Ac
    v. Other wetlands – 0.20 PDC/Ac

The allocation of PDC's for the subject property and any Pinelands area sales must be determined and a discussion of the PDC's should be included in the appraisal(s). The appraiser in the appropriate section of the appraisal must address the current status of PDC's. The status can be determined by contacting the Pinelands Development Credit Bank. If PDC's have been severed/transferred, the sale price and conditions of sale must be discussed in the appraisal in the same manner that any previous sale of the property being valued is reported (5-year sale history required.)

Data pertaining to transfers of PDC's over an extended period is available from the Pinelands Development Credit Bank, 501 East State Street, P.O. Box 035, Trenton, NJ 08625. The Pinelands Development Credit Bank maintains records of all PDC transfers that occur. For example: for the period of January 1, 2001 through July 13, 2001 there were 84 PDC's sold with a total of 341 development rights transferred. Consideration per development right ranged from a low of $1,000 to a high of $9,000 (there were two transactions with $0 consideration, these two sales along with several other low consideration sales were designated as "Transactions Involving Special Considerations").

It is apparent that there is significant activity in the market for PDC's. However, information from these transfers is suited for support information only. If used, Sales motivation must be discussed (i.e. sale in accordance with Pinelands Development Credit Bank special purchase program, sale from County to Pinelands Development Credit Bank, private sale, etc.)

It has been observed that the sale of PDC's does not necessarily represent the value of a development restriction as imposed by recording a conservation easement. Motivations of buyers and sellers of PDC's have a significant impact on their price/value level. An analysis of the prices of PDC's is a useful tool in establishing **support** of property values in the Pinelands areas, but should not to be used as **source** of property value levels (i.e. the price/value of the PDC plus the value of the land without PDC's may not be equal to the value of the property in fee-simple).

Physically Possible Uses

The utility and desirability of a rural property is influenced by its physical characteristics. Access, drainage, soils, size, shape, terrain, frontage, wetlands acreage, topography, and field size and configuration are some of the physical characteristics of rural property that must be considered when determining highest and best use. These property characteristics will control the selection and consideration of potential uses. All of the properties in a market compete for a particular use, therefore, in a limited or specialized use assignment the property with the most desirable characteristics, or combination of desirable characteristics, will be the most physically desirable.

It is important to recognize that one of the most important physical characteristics of rural property is soil. Soil is the basic component of value in a rural property used for the production of agricultural commodities because it is the medium of productive capability. Soil alone will not make a profitable agricultural enterprise; use and management of the soil determine the profit that can be realized from agricultural production.

Appraisal of rural properties that produce agricultural products should contain a full description of the soils on the property and an analysis of their potential uses and productivity. Soil must be evaluated in terms of potential productivity and desirability, which affects the value of agricultural property. Value may not be directly proportionate to the kinds of soil found on a property, but knowledge of this basic component is essential for all appraisers of rural properties.

The appraiser need not be an expert in soil science or agronomy, but he/she must be in contact with experts in these fields. The appraiser must gather the expert knowledge and make economic sense of it by relating soil information to the earning potential of the property being valued.[3]

An appraisal of agricultural property should include a soil inventory. A soil inventory provides information used in the application of the valuation approaches. For example: the appraiser in making sales comparison adjustments considers the soil characteristics of property. One kind of soil is judged to be more desirable than another. Therefore, the value the market ascribes to a given soil can be used in deriving an opinion of value by the sales comparison approach. In the income capitalization approach, the soil of the farm must be considered in relation to potential gross farm production and the operating expenses and level of management required to achieve that potential. The soils on a farm are the principal determinants of its income and expenses.

3 A complete discussion of soils, soil horizons, structure, consistence, and texture can be found in *Soil Survey Manual, Soil Survey Staff Handbook No. 18,* Soil Conservation Service, USDA, (Washington, DC: Government Printing Office, 1951, updated with supplements.

A rural appraiser makes use of several resources in the investigation and inventory of the soils of an agricultural property. Aerial photographs of the property and surrounding area, topographical maps, soil maps, and interpretive maps such as those that display the suitability or potential of the soils for various uses are valuable tools. Soil surveys and soil productivity maps contain information that is important for effectively appraising rural property.

Productivity ratings of soil are another important factor in rural appraisal. Compiled through various methods, productivity ratings summarize the effect of surface soil texture, subsoil characteristics, topography, climate, drainage, soil organic matter, and fertility on the productive capacity of soils. Productivity ratings are used to analyze the most suitable use and cropping patterns for a property, and are part of the highest and best use analysis of rural property. Productivity ratings provide a basis for estimating yields and potential income. They are also used as a means for comparing properties and making adjustments for varying productive capacities.

Capability classification is a grouping of soils that shows, in a general way, how suitable they are for most kinds of farming and/or different uses. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soil are grouped at three levels, the capability class, subclass, and unit. Roman Numerals I through VIII designate the eight capability classes in the broadest grouping. In class I are soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landform so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

The subclasses indicate major kinds of limitations within the classes. There can be up to four subclasses: e, soils with erosion limitations; w, soils with wetness limitations; s, soils which are limited mainly because they are shallow; and c, soils with a chief limitation that is climactic - that is it is either too cold or too dry. In class I there are no subclasses.

Within the subclasses are capability units, which are groups of soils alike enough to be suited to the same crops, pasture plants; require similar management; and have similar productivity and other responses to management.

Class I land has few limitations in use and in choice of plants. The land is nearly level (0-2%) and does not erode easily. The soils in this class are well drained, moderately permeable, and hold moisture well.

Class II land has moderate limitations in use and choice of plants. It requires the application of easily applied conservation practices or measures. Land is placed in this class when it has one or more of the following: (1) slopes (2-6%); (2) moderately eroded or susceptible to erosion; (3) imperfectly drained; (4) subject to occasional overflow; (5) somewhat unfavorable texture and consistency; or (6) layers which restrict the movement of moisture and air.
Class III land has severe limitations in use and in choice of plants. It requires the application of intensive conservation treatment. Land is placed in this class when it has one or more of the

following: (1) severe erosion or subject to severe erosion; (2) moderately steep slopes (6-10%); (3) very unfavorable texture or consistency; (4) shallow soils; (5) poorly drained; or (6) frequent overflows.

Class IV land has very severe limitations in use and in choice of plants. It requires the application of very intensive conservation treatment. Land is placed in Class IV when one or more of the following conditions exist: (1) very severely eroded, or is susceptible to very severe erosion; (2) steep slopes (10-15%); (3) very susceptible texture of consistency; (4) shallow soils; (5) poorly drained; or (6) very frequent overflows.

Class V land is often nearly level, wetland. It is best suited for pasture or trees.

Class VI land has severe limitations that make it generally unsuited to cultivation and has limits to its use. It is characterized by one or more of the following conditions: (1) steep slopes (15-25%); (2) severely eroded or has severe erosion hazard; (3) shallow soils; (4) stony soils; or (5) very unfavorable texture and consistency.

Class VII land is unsuited for cultivation and has very severe limitations that restrict its use. It is characterized by one or more of the following conditions: (1) very steep slopes (above 25%); (2) very severe erosion, or very severe erosion hazard; (3) shallow soils; or (4) very unfavorable texture and consistency.

Class VIII land is usually rock outcrops, sand, and gravel. It is suited only for wildlife or recreation. The land is best suited for trees.

Urban Grouping of soils is a classification of soils in accordance with their limitations for urban development. An Urban Group of one has few limitations for urban development; slopes are generally less than 8 percent; septic tank performance in the soils is generally very good; and excavation is not limited. An Urban Group of fourteen consists of soils that are generally deep, well drained to very poorly drained; having severe limitations for septic tanks; slight to severe limitations for excavation; and severe restrictions for foundation drainage.

Woodland Suitability ratings and groupings provide an indication of a soil's woodland productivity, limitations and potential as woodland habitats. A woodland suitability group 1 is a deep, moderately well drained, non-stony to very stony soil that is medium to moderately coarse textured with slopes of less than 8 percent. Group 9 soils are typically Rock land, made land, and borrow and fill areas with outcrops covering more than 50 percent of the surface of the Rock land.

In the Pinelands region, an important consideration is the depth of the water table on the sites that are either being valued or are used as comparable sales. While the soil types may be similar over a large area of property, the depth of the water table will have significant impact on the property's suitability to many forms of development, including agricultural development. The Pinelands Management Plan limits development of lands based on water table in many areas.

Improvements on a rural property can also be considered a part of its physical characteristics. The size, design, utility, and condition of the improvements must be developed. Some common improvements in the Pinelands include: irrigation and drainage systems; warehouses, screenhouses, machinery and equipment sheds, coolers/chillers, and labor housing. The existence, condition, and extent of improvements may have a significant impact on the value of the property. For example: a large blueberry farm that lacks an irrigation system would be considered to have some degree of functional obsolescence, whereas a similar unit with a highly developed solid-set or drip irrigation system would be more desirable in the marketplace. The location and placement of improvements on an agricultural unit is a physical characteristic that can exert influence on use.

Some physical restrictions can be cured. Land that tends to be wet can be drained (subject to legal limitations imposed by regulation such as wetlands protection acts, local conservation restrictions, and comprehensive land use regulations) and hedgerows can be removed with heavy equipment. Laser leveling can improve the use of water and make production easier on a particular tract. The cost to cure a deficiency must be recognized if a correction is contemplated. An appraiser cannot assume that fields can be leveled, drained, or otherwise improved to attain a higher use without considering the other three criteria of highest and best use – i.e., the cure must be legally permissible, financially feasible, and maximally productive. An economic analysis may be required to evaluate if and how a physical restriction can be cured.

Financially Feasible and Maximally Productive Uses

Consideration of legal permissibility and physical possibility generally eliminates many of the potential uses. All legal and physically possible uses are tested in an economic model to determine which uses will result in positive stabilized cash flows.

The financial feasibility of any income-producing property is estimated through the development of pro forma income and expense statements for each use. Anticipated gross income is estimated, any allowances for vacancy and/or credit loss are made, operating expenses are calculated and subtracted from the effective gross income, and a likely net operating income ("NOI") is derived for each use. A rate of return for invested capital is then estimated. If the NOI resulting from a potential highest and best use is sufficient to provide the required rate of return for invested capital **and** a positive return to the land, then the use is considered to be financially feasible. The process is identical whether the highest and best use consideration is for a commercial or industrial property or it is for an agricultural income-producing property.

In situations where the potential revenue from the property does not exceed expenses, the question that needs to be answered is *which of the uses is the least costly use*. This situation is generally short term and is not uncommon in rural valuation. Market participants anticipate that

the gain in land value (i.e., appreciation) will pay for the accumulated losses and provide a positive overall return to the investor.

The potential use that satisfies the first three criteria and results in the highest residual land value is considered to be the property's highest and best use. Residual land value can be estimated by estimating the value of the land and improvements for the selected use; subtract the costs of labor, capital, and coordination (management) necessary to construct improvements; and subtract the total accrued depreciation attributable to the improvements. Alternatively, residual land value can be estimated by measuring the residual income remaining after all expenses have been paid and allocating the net income to the land and improvements; then the residual income attributable to the land is capitalized by applying an appropriate capitalization rate. (In appraisal methodology, this is the straight-line, land residual capitalization method.)

Appraisers should include a complete highest and best use analysis of the property being valued and include it in the appraisal report. If improvements are included in the valuation assignment, the highest and best use of the property as if vacant and available for improvement to its highest and best use **and** the highest and best use of the property as it is currently improved must be included along with a reconciliation of highest and best use.

Sales Analysis

The foundation any appraisal is the analysis of available data from the market. It is important that the users of appraisal reports be given the benefit of the appraiser's knowledge of the market and his/her analysis of the data from within the market. The appraiser studies comparable sales to derive market capitalization rates used in the income approach to value, to estimate the amount and rate of depreciation used in the cost approach, and to measure and apply the adjustments used in the sales comparison approach.

Appraisers must conduct a thorough review of the real estate market before selecting comparable sales, comparable rentals, and other data necessary to complete an appraisal report. All information used in a quality and credible appraisal report is derived from the market.

The appraiser must carefully collect and verify all comparable sales and rentals. Comparable sales are classified as *Improved* and *Unimproved* based on the presence of land and/or building improvements. (It is customary in rural appraisal to include some improvements, such as fencing, drainage, landscaping, etc. in the land and, therefore, classify sales with this type of improvements as "unimproved". Similarly, the presence of permanent plantings may be included as a separate sub classification of "unimproved" sales.) Puritan unimproved sales, those with only one land classification or land use classification, lend support for land class ratio analysis. The valuation of the land component of improved sales is facilitated through the analysis of the unimproved land sales.

Most appraisers have developed their own techniques for gathering and analyzing sales data. Some suggested sources of comparable sales information in the Pinelands area and areas that can provide other comparable sales data that may be useful include:

- Regularly published databases such as those available from First American Real Estate Solutions (formerly RediData)
- Real estate professionals, including brokers and other appraisers
- Title and abstract companies
- Attorneys familiar with real estate transactions
- Local assessment officials
- County deed records
- Local agricultural lenders including the USDA/FSA and the Farm Credit Service
- The Pinelands Commission (Beginning about January 1, 2002, the Commission will have a data base of sales, by district extending for several years. They will have information on unimproved sales only as they are not maintaining a database of residential sales.)
- Local and regional Multiple Listing Services (MLS)
- County Agricultural Development Boards (CADB)
- State Agricultural and Development Commission (SADC)

The Pinelands area has unique legal and physical characteristics. Therefore, the selection and analysis of sales is of paramount importance. The data sources listed above can provide numerous "leads" for the appraiser, but it is incumbent on him/her to fully analyze and verify the sales that are to be used in the valuation process. These same data sources may also be potential sources of rental information.

In selecting sales for use in the appraisal of properties in the Pinelands area, first choice should be given to sales of similar property within the region; emphasizing those sales located in similar zones within the pinelands (i.e., when appraising property in an Agricultural Production Area, sales from Agricultural Production Areas should have priority in the selection process). If there are insufficient sales available within the Pinelands region, consideration can be given to sales outside the Pinelands.

If sales from areas outside the Pinelands are used in the valuation process an evaluation of comparability may be required and should be documented in the report. Evaluation should include an analysis of the similarity of the sales to the subject in terms of:

- Property rights conveyed – For example, if the subject property is located in a Special Agricultural Production Area, a district which effectively restricts development to housing for use by farm employees and family members involved with the farming operations, the sales should reflect similar development restrictions. Sales of agricultural property that have transferred subject to a recorded conservation easement may be suitable in this instance.

- Highest and best use – The sale properties must have a highest and best use that is comparable to that of the subject. The appraiser is cautioned that merely having an agricultural highest and best use may not represent comparability in the Pinelands markets. Highest and best use must be more specific and delineate the type of agriculture to which the sale and subject properties are suited (e.g., cranberries, blueberries, vegetable crops, orchard, field crops, nursery crops, etc.).

  The appraiser must also be aware of the presence of fundamental shifts in highest and best use that may occur subsequent to the severance of development rights from a property. In some markets there has been a tendency for restricted properties (properties from which the right to develop has been severed) to be purchased as part-time agricultural units or for estate-type home sites with complimentary agricultural use. Sales of property that have transitioned to these uses may not be comparable to the property being valued. There may be, however, some areas of the Pinelands that will experience a similar transition at some time. The appraiser should conduct careful research to determine the appropriate highest and best use of the subject property, which in turn will dictate the selection of appropriate comparable sales for use in the appraisal process.

- Location – Sales selected from outside the Pinelands area should be from areas, which exhibit a high degree of similarity to the Pinelands area in which the subject property is located. In addition to location relative to markets and marketing opportunities, the appraiser should consider the requisite agricultural infrastructure, population, highway and transportation routes, and climactic similarities.

- Time – The relative timing of the sale should be representative of the time of valuation. If an extended period has elapsed between the date of the sale and the date of the valuation an adjustment for the changes in market conditions must be considered. (It should be noted that, generally, those properties, which have had their rights to develop severed, demonstrate less market volatility than do properties that transfer in fee. The appraiser should do a thorough investigation of the market over an extended period of time to determine what, if any, adjustment for market conditions [time] may be required in the comparison process.)

- Other Considerations – The appraiser should also consider any other elements, or attributes that the market identifies as contributing value to real property. Adjustments for any physical and/or economic characteristics should be made to sales to reflect the market preferences.

In areas where there is one dominant or predominate land use, or land classification, sales data can be easily analyzed based on its use and classification. However, in areas with multiple land characteristics the analysis becomes more complex. An accepted technique for estimating the contributory value of multiple land use classes is *land class ratio analysis*, sometimes referred to as ratio analysis.

(*The following discussion emphasizes ratio analysis. Other methods of analyzing sales are available to the appraiser, but ratio analysis is the preferred method in rural valuation*. ***Proper analysis of rural property sales requires an analysis based on land use and/or class***.)

The first step in developing a land class ratio analysis is to place all unimproved sales in a summary format reflecting their total sale price, date of sale, overall size, and sale price per acre as well as the acreage distribution among the predominate land classes or uses that are recognized in the market. The land classes specified may be Class 1 cropland versus Class 2, 3, and/or 4 cropland; open land versus wooded land; cultivated land versus pasture; or any other observable land classifications recognized in the market where the property being valued is located.

In areas where the production capability of the soil is well recognized by market participants, productivity indexes may serve as the identifiers of land classes on the subject and comparable sale properties. Extreme caution should be exercised when using productivity indexes. Sometimes the production capabilities of a given soil type or land class do not enhance its value. Productivity indexes are used in this type of analysis only when buyers and sellers appear to readily recognize the production capabilities associated with the farms purchased.

The following table presents a sample unimproved land sales summary for land class ratio analysis.

Table 1

						Contributory Value			
		Sale				Crop	Crop	Pasture	Pasture
Sale No.	Date	Price	Acres	Location	$/Acre	Acres	$/Acre	Acres	$/Acre
1	6-mos	$225,000	450	Avg.	$ 500	0		450	
2	6-mos	$500,000	500	Avg.	$1,000	500		0	
3	6-mos	$362,500	525	Avg.	$ 690	200		325	
4	Current	$320,625	375	Avg.	$ 855	300		75	
5	1-yr	$696,100	700	Avg.	$ 994	600		100	
6	Current	$517,500	690	Good	$ 750	300		390	
7	6-mos	$400,000	526	Good	$ 760	200		326	
8	1-yr	$650,000	594	Good	$1,094	509		85	

It is evident that Sales 1 and 2 are "puritan" land sales – i.e., sales having only one class of land. Sale 1 suggests that pasture in an average location had a value of $500 per acre six months ago. Sale 2 suggests that crop in an average location had a value of $1,000 per acre six months ago. The land values by class for Sale 3 are determined using simple abstraction. Assume that, based on Sale 2; the cropland in Sale 3 has a value of $1,000 per acre. Note that Sale 2 and Sale 3 have similar size, location, and date of sale. By abstraction, the pasture value on Sale 3 is concluded to be $500 per acre.

Analysis of Sales 4 through 8 indicates that one cannot directly apply the $1,000 per acre for cropland or the $500 per acre for pasture to any of these sales. Among the factors that distort the direct application of these values are differences in time or location. If a $1,000 per acre value is assigned to the cropland in Sale 4, then the value of the pasture is about $275 per acre; conversely, if the $1,000 per acre cropland value is applied to Sale 5, a residual value of $961 per acre is suggested for pasture in Sale 5. Both of these indications are inconsistent with the information revealed through the analysis of the first three sales.

To develop the analysis of the other sales in this market, a land class ratio is developed based on the analysis of the puritans, Sales 1 and 2. In this instance the ratio is as follows:

Table 2

Land Class	Indicated Value per Acre	Ratio (%)
Cropland	$1,000	100%
Pasture	$ 500	50%

The market indicates that pasture has a value of approximately 50% of that of cropland.

Using the ratio that is developed, the other sales can be analyzed. The following table provides an analysis of Sale 4.

Table 3

Analysis of Sale 4			
Cropland	300 ac. X 100% =	300.00	
Pasture	75 acres x 50% =	37.50	
Total	375 acres =	337.50 net crop equivalent acres	
Total sale price of Sale 4		$320,625	
Then: $320,625/337.5 net crop equivalent acres =		$950	
$950/ac. X 50% =		$475	
Conclude:	Sale 4's cropland value	$950/Acre	
	Sale 4's pasture value	$475/Acre	
Proof:	300 ac. Cropland @ $950/ac. =	$285,000	
	75 ac. Pasture @ $475/ac. =	$ 35,625	
	375 ac. Total @ $855/ac. =	$320,625	

The important part of the example lies in the proof shown. This indicates that if the $950 per acre is applied to the 300 acres of cropland and the $475 per acre is applied to the 75 acres of pasture, then the total sale price should equal $320,625. This confirms that the analysis of the sale is correct.

An identical procedure is applied to each of the other sales. Remember, the proof is the most important part of the analysis, at least until the appraiser becomes totally familiar and comfortable with the land class ration analysis.

After completing similar land class analysis for the remaining unimproved land sales, estimated values per acre for each respective land class can be incorporated into the grid as demonstrated in table 4.

Table 4

						Contributory Value			
Sale No.	**Date**	**Sale Price**	**Acres**	**Location**	**$/Acre**	**Crop Acres**	**Crop $/Acre**	**Pasture Acres**	**Pasture $/Acre**
1	6-mos	$225,000	450	Avg.	$ 500	0	N/A	450	$500
2	6-mos	$500,000	500	Avg.	$1,000	500	$1,000	0	N/A
3	6-mos	$362,500	525	Avg.	$ 690	200	$1,000	325	$500
4	Current	$320,625	375	Avg.	$ 855	300	$ 950	75	$475
5	1-yr	$696,100	700	Avg.	$ 994	600	$1,071	100	$535
6	Current	$517,500	690	Good	$ 750	300	$1,045	390	$523
7	6-mos	$400,000	526	Good	$ 760	200	$1,102	326	$551
8	1-yr	$650,000	594	Good	$1,094	509	$1,179	85	$589

After the completion of the analysis of unimproved sales in this market, various characteristics can be observed and the affect of these characteristics on market price levels can be measured. For example, it is evident that price levels are changing with time, and that in this market the price levels are declining. It is also evident that property with an average location sells at a lower price level than does property with a good location.

The analysis of sales data using the land class ratio enables the appraiser to make some logical sense out of what may appear to be nonsensical markets. The raw sales data does not present any apparent logic in the market. Prices range from a low of $500 per acre to a high of $1,094 per acre and the relative price relationships resulting from changing market conditions (time) and property location are not apparent. However, after analyzing the market based on land use classifications and their proportionate contribution to the total sale, analysis of the appropriate attributes can be completed.

The land class ratio analysis can be applied to any type of rural and/or agricultural property. It will work equally as well with vacant, unimproved land and with land improved with permanent plantings. Relationships and ratios can be established based on varietal differences (i.e., Weymouth vs. Blue Crop vs. Duke with blueberries or Early Black vs. Stevens vs. Ben Lear with cranberries), based on age of planting(s), or based on yields. The important thing for the appraiser to remember is that the marketplace will define the basis for the relationship(s).

After analysis of sales using land class ratios, the measurement of various adjustments required in the sales comparison approach is more easily accomplished. (As was previously indicated,

there are other methods of sales analysis that are acceptable. However, analysis based on land use and/or class ***is required*** in rural appraisal. In the data collection phase of the appraisal, the appraiser should gather various types of data including: productivity of permanent plantings, soil capability and quality, relative location of sales and subject property, size, etc. The appraiser can identify those elements on which the marketplace places value and measure the value changes relative to the attribute differences.

A complete sales analysis procedure must include collection and analysis of the income and expense attributes of the sales. The appraiser should explain the method of estimating these elements and whether it was gathered based on a cash lease, crop-share, or owner-operator income analysis. Only one methodology should be employed in the analysis of sales and application of the valuation process, not a combination of two or three different income estimating procedures.

Once the net income has been determined for each comparable sale is estimated, it is divided by the sale price of the property to develop an overall capitalization rate. The rates derived from an array of sales should be summarized in a table or grid. The final selection of a capitalization rate to be applied in the valuation of the subject property should be discussed in significant detail.

Sales used in an analysis and extraction of a market capitalization rate *do not* have to be subject to some type of rental agreement to be effective market indicators. In some appraisal circles a myth has developed that a comparable sale that is not rented at the time of its sale cannot be used to extract an overall rate. This is fallacy. If one is careful to apply a typical market rent (or typical production levels in the case of crop-share or owner-operator analyses), an accurate indication of the sale's ability to generate income can be developed. A sale subject to a rental agreement at the time of sale may or may not be reflective of typical market rental levels. The analysis will be skewed if the contract rent is either above or below market rent.

The analysis of improved sales provides information and data that is useful in the application of the cost approach to value. The appraiser must estimate the reproduction or replacement cost new (RCN) of any improvements on the sale and subject properties. The cost estimates used must be verified with reliable cost services and/or actual construction costs obtained from local sources. In addition to the cost new analysis, the appraiser must analyze the accrued depreciation inherent in the improvements. A depreciation rate can be developed through analysis of improved sales in the market. Market support for depreciation using the abstraction technique is preferred in rural appraisal, but other, less precise, procedures such as the age-life method and modified economic age-life method can also be used.[4]

4 A complete discussion of abstraction and application of depreciation rates and depreciation methodology can be found in Chapter 13 of *The Appraisal of Rural Property*, Second Edition (Chicago, American Society of Farm Managers and Rural Appraisers and Appraisal Institute, 2000)

It has been noted that many farm and rural properties have a significant number of building improvements. Often, these improvements have been constructed over a period of time extending, in some instances, over several generations. The appraiser must be aware that not all of the improvements on a farm property have economic value and contribute to the overall value of the sale or subject property.

It is not unusual for an economically obsolete improvement to be in use long after its economic viability has expired. For example, there are many old-style barns and machinery storage buildings that have been adapted for alternative storage uses. These barns, if destroyed would either not be replaced or, if replaced, would be replaced with buildings having considerably different design, utility, and construction. Similarly, many livestock farms have old-style, wooden stave silos that were once used for forage storage. Most of these silos have no utility in modern farming operations, yet they remain on the farmstead an apparent integral part of the building complex. However, if they were to be destroyed for any reason, they would not be replaced.

Careful analysis of sales and the market will identify for the appraiser those buildings that do and do not contribute to property values.

It must be remembered that judgment is always necessary in the appraisal process. Preconceived notions and "rules of thumb" should be eliminated from the appraisal process. Proper data analysis places clear parameters on the appraiser's judgment.[5]

Sales Comparison Approach to Value

The sales comparison approach to value is a technique whereby the appraiser determines value by comparing a property being appraised – the subject property – to similar properties that have recently sold. Similarities should exist in terms of property rights conveyed, highest and best use, size, location, and any other attributes identified in the marketplace.

The first step in the process, after gathering and verification of data, is the identification of units of comparison. Theoretically, comparisons are made between whole properties; however, rural property appraisers typically must compare properties with physical attributes and land and building composition that vary significantly. Therefore, it is common practice for the rural appraiser to reduce the total property to a single unit that is representative of the whole.

5 The Appraisal of Rural Property, Second Edition, (Chicago, American Society of Farm Managers and Rural Appraisers and Appraisal Institute, 2000)

Various units of comparison can be used to analyze rural property. The most common unit of comparison is price per acre, derived by dividing the total sale price by the total acres. Applying this unit of comparison allows the total property to be represented by a single acre. The market does not always recognize the per acre price as the unit of comparison. For example, thorough analysis of livestock sales may result in a conclusion that the most representative unit of comparison is the Animal Unit (AU) or Animal Unit Month (AUM). Other units of comparison commonly found on rural properties include:

- Cow year long (CYL) – livestock farms
- Stanchion or free-stall (FS) – dairy farms
- Thousand board feet (MBF) – timber property
- Barrel of production – cranberries

Analysis of sales and comparative analysis in the sales comparison approach is conducted on the unit of comparison indicated by the market. In reporting final value, the value opinion is often converted to a per acre price.

Adjustments are measured and applied in the sales comparison approach using elements of comparison. Application of the approach requires identification of the variations among properties, measuring the value impact of the variations, and applying appropriate adjustments to the sales to reflect the subject property's relative position to the sale – i.e., the sale price per unit is increased or decreased for each significant variation between the sale and the subject.
The number of potential differences is nearly infinite. Although the appraiser should note all the characteristics of the subject and the sales, only those differences that are significant and reflected by the market must be identified and measured. It is important that the appraiser not get more sophisticated than the market in identification and measurement of the differences.

The differences in rural properties can usually be classified under the basic elements of comparison: property rights conveyed, financing terms, conditions of sale, market conditions, location, physical characteristics, and income characteristics.

The measurement and application of adjustments in rural appraisal are identical to those in other appraisal disciplines. Therefore, no extended discussion will be included in this procedure. However, two physical characteristics require extensive comparison among rural properties and produce the greatest number of variations to be considered by the appraiser. They are:

1. Land features and improvements
2. Building improvements.

These two characteristics differ between nearly every farm. Said another way, there are very few farms or rural properties that have similar, or comparable land features and improvements and improvement balance and mix. Therefore, particular care must be taken in identifying the presence and impact of these two characteristics.

Once the land class ratios and the building allocations have been developed for sales, they should be compared directly to the subject's land and buildings to derive an adjustment to reflect each

sale's land mix and building contribution. When comparing the sales to the subject in terms of land and buildings, all other elements of comparison are ignored or assumed equal.[6]

The land adjustment process is predicated on the following assumption: If all other elements of comparison for the subject and a given sale were equal, then the subject's cropland can be nor more or less valuable on a per-acre basis than the cropland value of the sale being compared to the subject. This is true for each and every class of land, regardless of its value contribution in a particular market.

The land adjustment reflects the difference in acreage between the sale and the subject property, and the valuation should reflect the different ratios of total acreage in cropland, pasture, woods, orchards, etc.

For the purpose of demonstration and example, assume that the subject property has the following basic characteristics.

Table 5

Date of Valuation	Current
Location	Good
Total Acres	510
Cropland Acres	400
Pasture Acres	110

Using the sales data presented earlier in this section, table 6 illustrates how to compare the sales to the subject for land balance and mix. Note that the details of each sale are shown on the left side of each table, while the subject characteristics are shown on the right. The per-acre land class values for each sale are identical to those in the table on page 32.

Note: Table 6 demonstrates the most commonly accepted methodology for concluding a land balance and mix adjustment. Other methods are available, however the rural appraisal profession has accepted this approach.

6 *The Appraisal of Rural Property*, Second Edition, page 178, The American Society of Farm Managers and Rural Appraisers and The Appraisal Institute, Chicago, 2000

Table 6

	Sale 3				Subject		
Land Class	Acres	$/Acre	Total	Land Class	Acres	$/Acre	Total
Cropland	200	$1,000	$200,000	Cropland	400	$1,000	$400,000
Pasture	325	$500	$162,500	Pasture	110	$500	$55,000
Total	525	$690	$362,500	Total	510	$892	$455,000

Indicated land adjustment to Sale 3 = $202

	Sale 4				Subject		
Land Class	Acres	$/Acre	Total	Land Class	Acres	$/Acre	Total
Cropland	300	$950	$285,000	Cropland	400	$950	$380,000
Pasture	75	$475	$35,625	Pasture	110	$475	$52,250
Total	375	$855	$320,625	Total	510	$848	$432,250

Indicated land adjustment to Sale 4 = -$7

	Sale 5				Subject		
Land Class	Acres	$/Acre	Total	Land Class	Acres	$/Acre	Total
Cropland	600	$1,071	$642,600	Cropland	400	$1,071	$428,400
Pasture	100	$535	$53,500	Pasture	110	$535	$58,850
Total	700	$994	$696,100	Total	510	$955	$487,250

Indicated land adjustment to Sale 5 = -$39

	Sale 6				Subject		
Land Class	Acres	$/Acre	Total	Land Class	Acres	$/Acre	Total
Cropland	300	$1,045	$313,500	Cropland	400	$1,045	$418,000
Pasture	390	$523	$203,970	Pasture	110	$523	$57,530
Total	690	$750	$517,470	Total	510	$932	$475,530

Indicated land adjustment to Sale 6 = $182

	Sale 7				Subject		
Land Class	Acres	$/Acre	Total	Land Class	Acres	$/Acre	Total
Cropland	200	$1,102	$220,400	Cropland	400	$1,102	$440,800
Pasture	326	$551	$179,626	Pasture	110	$551	$60,610
Total	526	$761	$400,026	Total	510	$983	$501,410

Indicated land adjustment to Sale 7 = $223

	Sale 8				Subject		
Land Class	Acres	$/Acre	Total	Land Class	Acres	$/Acre	Total
Cropland	509	$1,179	$600,111	Cropland	400	$1,179	$471,600
Pasture	85	$589	$50,065	Pasture	110	$589	$64,790
Total	594	$1,095	$650,176	Total	510	$1,052	$536,390

Indicated land adjustment to Sale 8 = -$43

The building adjustment is calculated through a direct comparison of the individual buildings on each sale property to the subject's buildings on a per-building, per-square foot, or per-unit of comparison basis. Judgment is required in the comparison process. Detailed market research and appropriate building allocation on comparable sales set the parameters and inform the appraiser's judgment in the direct comparison process.

Once the land and building adjustment analyses are completed, the sales can be compared directly to one another and the subject for any other elements of comparison determined to be appropriate. These other elements may include: property rights conveyed, conditions of sale, market conditions, location, size, and other characteristics.

The elements of comparison found to be significant and recognized by the market can be analyzed and individual pairings can be developed and applied in the sales comparison approach.

Income Approach to Value

The income capitalization approach to value is primarily used to value income-producing property. In rural income analysis, distinctions are drawn between cash rental income, owner-operator income, and crop-share income. To apply this approach, the appraiser must research the expected, or anticipated typical: gross yields and prices to estimate the gross income level; vacancy and credit losses; operating expenses; patterns and/or durations of appropriate income streams; and anticipated resale values or appreciation rates for property that is similar to the property that is the subject of the appraisal. Whenever an income estimate is used to derive an overall rate to use to value the property, the rate must be appropriate and consistently derived and applied.

The income capitalization approach allows the appraiser to convert anticipated monetary benefits of property ownership into a value estimate. This is done either by discounting anticipated future income into a present value estimate using yield capitalization or by capitalizing an income stream into perpetuity using an overall capitalization rate through direct capitalization.

The essential steps for estimating the income of a rural property are:

1. Determine the typical income arrangement for the area (cash rent, crop-share, or owner-operation).
2. Ascertain the crops that will most likely be produced on the property being valued.
3. Estimate property yields based on property-specific data or local area data. Care must be taken to ensure that the yields are typical for the area and the property's soil resources.
4. Estimate typical commodity prices.
5. Determine the crop share for percentage rents (if applicable).
6. Determine property-specific terms and market rental terms for cash rents (if applicable).

Direct capitalization converts an estimate of a single year's anticipated income into an indication of value in one step, either by dividing the income estimate by an appropriate rate or by multiplying the income estimate by an appropriate, market derived, multiplier or factor. The rates and factors are extracted from actual sales data. Only the first year's income is considered in this methodology. Yield and value change are implied in the direct capitalization process, but

are not specifically identified. Direct capitalization may be based on potential gross income, effective gross income, net operating income, equity income, mortgage income, land income, or building income. This methodology is commonly applied in the valuation of most field crop farming operations.

Yield capitalization is a method that converts future benefits into a present value through the discounting of each anticipated future benefit at an appropriate yield rate or by developing and applying an overall rate that explicitly reflects the property's income pattern, anticipated value change, and yield. This methodology is commonly applied in the valuation of any rural property that has an extended time between beginning of operations and economic operation (i.e., construction, population, and operation of intensive livestock facilities), and in the valuation of permanent plantings.

In the application of discounted cash flow analysis in valuing permanent plantings particular care must be given to certain attributes. The first consideration is development time and income producing life of the planting. There is generally a significant time period between the actual planting of a permanent planting and the time at which the planting produces an economic harvest. Another consideration is the stage of development of the planting. Is it developing or immature, mature, or in decline. Each stage has different appraisal emphasis.

Markets and marketing have a significant impact on income and expense estimates. Crops grown for the fresh market may have higher relative prices accompanied by higher expenses than those grown for processing markets. Management and management practices have significant impact on cash flows. And, the appraiser generally must also develop an estimate of the reversionary value of the property at the end of the holding period. Each of these considerations can have significant impact on the reliability of the income analysis completed using yield capitalization.

Cost Approach to Value

Application of the cost approach to value in rural appraisal closely parallels the application of the approach in other valuation disciplines. Like in the sales comparison approach, a detailed and thorough sales and market analysis will provide the information requisite to completion of a credible cost approach valuation of a subject property.

Land value is considered in terms of its highest and best use. Even when the site is improved, the value is based on the highest and best use as though vacant. There are six techniques, or procedures, that are commonly accepted for determining the value of land:

- Direct sales comparison
- Allocation
- Extraction
- Subdivision development
- Land residual
- Ground rent capitalization

In rural appraisal, valuing individual components that comprise the subject property develops the land value. This methodology is a variation of Allocation and is generally preferred for application in the cost approach because it is often difficult to locate rural properties that are alike in terms of land balance and mix. A sales comparison process can be employed as well.

Cost data is derived from local builders and published cost guides that are accepted in the market area.

Several methods of estimating depreciation are available for use in the cost approach analysis. All are sometimes applicable to valuing rural property. If buildings are not a significant part of the subject, abstracting an overall rate of depreciation is sufficient. An age-life comparison may be performed, using market-derived information to estimate the effective age and economic life estimates applied to the subject's improvements. For those properties that are building intensive, the breakdown method applied with market-derived rates is the most applicable and will generally result in the most reliable estimates of value.

All of the methods and techniques that are employed depend on sales data from which estimated rates of depreciation and values for land components are derived. As is the case in all three approaches to value, the opinion of value developed through the application of the cost approach will be only as good as the data available and the appraiser's ability to analyze that data.

VALUING SPECIALIZED AGRICULTURAL PROPERTIES

Agriculture in the Pinelands is varied. It can easily be said that there is no typical agricultural production in the region. However, the agriculture can be generally grouped into categories as follows:

- Field Crops, including corn, soybeans, hay, forage crops, etc.
- Nursery crops (generally field grown, but may be grown in containers)
- Vegetables
- Small fruits, including blueberries
- Tree fruits, primarily peaches
- Cranberries

The valuation of the more traditional agricultural properties, such as field crops and most nursery crops, is completed using techniques and methodology that are similar to those employed in the valuation of other property types. As has been outlined previously, adaptation of traditional techniques is required in valuing rural property.

Permanent Plantings[7]

Small fruits, tree fruits, and cranberries can be classified as ***specialized*** agricultural properties requiring specialized expertise in their valuation. Each of these crops, or commodities, can be generally described as ***permanent plantings***. This type of agricultural property requires specific understanding of the ways in which traditional valuation techniques are applied.

The appraiser must focus on the specific horticultural crop produced by the permanent planting, which requires a comprehensive knowledge of the particular variety of tree, vine, or bush and its characteristics, production, and requirements. If the appraiser is not knowledgeable about the variety of produce being cultivated on the property, a horticultural consultant should be engaged.

Permanent plantings require a number of years to reach maturity, and these plantings commit the land to that particular use for the economic life of the plantings. Specialized properties such as orchards, vineyards, and groves usually have a higher value per acre than open land in the same locale.[8] The development and maintenance of permanent plantings requires specialized skills to ensure that the plants reach and maintain their genetic potential. Poor management can cause stress due to parasites or lack of water; the resulting damage may adversely affect the value of the property.

7 A complete discussion of the valuation of permanent plantings can be found in *The Appraisal of Rural Property*, Second Edition (Chicago, American Society of Farm Managers and Rural Appraisers and Appraisal Institute, 2000

8 There are some exceptions, such as highly specialized vegetable land in rich growing areas such as the coastal valley areas of California. There are few exceptions on the east coast of the US.

There is significant variation in permanent crops, even within small geographic regions. Appraisers must be knowledgeable of the land's potential capacity to produce different varieties of permanent crops as well as all costs associated with their development and production. In addition to the normal ground preparation, planting, and fertilizing, it usually takes several years before permanent plantings generate a positive cash flow. The time required to establish a permanent planting can range from 3-years to 12-years, as compared to field crops that typically have a one-year growing season.

The life cycle of permanent plantings moves from infancy to the point of establishment, when annual income exceeds pre-harvest and harvest costs, through a period of mature production, and ultimately to decline. For example: a fruit orchard may take five to seven years to reach mature production, produce at a stable level for 30 years, and decline after 40 years. Certain peach orchards may reach mature production after seven years but begin to decline after 20 years. Some blueberries may be up to 3 years old when first planted reach mature production after 3 additional years and begin to decline after about 20 years.

Permanent plantings are generally found in one of three stages of development: developing or immature, mature, or decline. Each of the three stages requires a different appraisal emphasis.

The permanent planting must represent the highest and best use of land as improved. During the investigation of a developing or immature planting, it may be discovered that the property cannot be expected to develop into a successful orchard, and its value for alternative uses should be considered. In this case, the property value could be less than vacant land value since the appraiser must deduct the estimated cost of removing the trees or vines and preparing the land for alternative uses (accounting for the cost to cure).

The maximum value levels for permanent plantings are realized and sustained when the following conditions are met:

1. The soil is appropriate for the species and varieties cultivated;
2. The locale, including climactic conditions and water availability and quality, are appropriate for the crop;
3. Markets for the crop are well-established and accessible; and
4. The permanent planting is effectively managed.

Effective management includes consistent replacement of damaged or dead plants; reduction of climactic hazards through irrigation, frost protection, and drainage facilities; and utilization of appropriate and cost-effective pest control measures.

When appraising a permanent planting, the appraiser should note the size and quality of the fruit produced, the average production (preferably for the last five to 10 years), the method of marketing, and significant varieties. The desirable size is affected by the characteristics of the variety and the consumer's preference. All vineyards, orchards, and groves produce varied sizes of fruit, from small to large. Packing house reports can usually supply information on grower returns and the size quality, and pricing of fruit. Generalized pricing information is also available through the New Jersey offices of the National Agricultural Statistics Service.

Even with a compatible combination of crop, soil, and climate, the profitability of a permanent planting is largely dependent on management decisions concerning pollination, spacing, pruning, replacement, frost protection, pest eradication, energy sources, and variety selection.

One of the objectives of a permanent planting is to develop maximum yields of high-quality fruit per acre, with a minimum of time and cost. The variety of rootstock, vine, or bush planted; the size of the trees, bushes, or vines; and their pattern of arrangement directly affect this goal. The planting pattern should be suitable for the vigor of the stock and the ultimate size of the planting. It should facilitate pest control, cultivation, harvesting, and efficient use of the land, whether dwarf varieties, standard varieties, or high-density plantings are used. In high-density plantings of some tree fruits, the excess trees may eventually be removed or hedged to give the mature trees adequate room and sunlight.

Sometimes growers try to renew plantings by interplanting young plantings alternately with older ones. The plan is to establish the younger plantings, prune back the older ones gradually, and then remove the older plantings entirely. This plan has disadvantages, however, because the young plantings are often shaded by the older ones, choked by weeds, damaged by equipment, or not properly irrigated. Planting density should be determined by variety, rootstock, and soil fertility.

For many crops, varietal preferences can shift rapidly, as new varieties with superior physical characteristics are developed, introduced, and gain popularity over older, established varieties. A new variety of fruit, for example, may have a deeper, brighter color, mature a few weeks earlier, or have a longer shelf life and thus be preferred over an older variety. The appraiser must keep up with market preferences and develop techniques to measure or track these trends. Varietal preferences may be quantified by tracking market share or by surveying packers and brokers.

Markets for most permanent crops can be controlled or regulated in some manner by marketing orders, commissions, boards, or other commodity groups. It is incumbent on the appraiser to understand the structure of the market for the permanent crop under analysis. In many cases, these marketing groups are voluntary. In other cases, participation is mandated by federal regulation. The marketing entities may also establish size or quality standards for shipment of the product, adding another element of control to the market.

Payments for production controlled by such entities may also be nontraditional. Crop proceeds may be distributed by various methods, which prolong payment over a significant period of time after the actual physical delivery of the crop. Returns to the grower, then, may not follow the typical pattern of cash payment upon delivery of the crop, which is assumed in most markets.

Marketing or regulatory commissions or entities may be sources of data for market analysis. They may be able to offer the appraiser historical information on relevant factors such as bearing acres, nonbearing acres, past production, prices, and yields. Some groups track sales of nursery stock of trees, vines, or bushes for plantings, which can allow the appraiser to monitor trends in recent, nonproductive plantings.

Statistical data on bearing and nonbearing planted acreage, average production, and average price is useful to the appraiser of permanent plantings. This data can assist in the identification and projection of trends in supply, demand, and commodity prices. The information is compiled and distributed by various governmental agencies, including the USDA Economic Research Service (NASS), cooperative extension services, state agricultural statistics offices, county agricultural commissions, and some commodity organizations.

Appraisers need to verify more comprehensive data for sales of permanent crops than for sales of less complex agricultural properties. The verification should include all the information needed to analyze the sale property in all three approaches to value. Appraisers need to confirm the marketing periods of the sales, the date of possession of the sale property, the type of planting, its vitality and condition, the age of the planting, production over an extended period (normally five to 10 years), the varieties planted, and other similar information.

One of the more important considerations in valuing permanent plantings is a thorough understanding of the acreage being valued and the acreage reported in sales. While it may seem to be a straightforward determination, the appraiser must be aware that not all growers report acreage in the same way. Indeed, a grower may report his/her acreage using four (4) different numbers.

One acreage report may be based on total acreage owned. That is, the aggregate total acres under ownership by the grower. A second acreage may be total acres planted, including roads and support lands. This is common in many tree, vine, and bush plantings. This reporting generally does not include excess acreage not associated with the production unit. A third acreage report may be of producing acres only. This is generally a report of acres in production and does not include: roads, support lands, or immature plantings that are not yet in production. Finally, a grower may report planted acres. This is a reporting of total acres planted to a particular permanent planting but does not include roads, support land, or excess acreage.

The appraiser must be fully aware of the acreage being reported and be consistent in his/her reporting of acreage for sales and the subject property. He/she must not use one reporting method for sales and a different one for the property being valued.

CRANBERRIES

The information found on the following pages has been provided to provide an example of the type of industry analysis that must be prepared for specialized agricultural businesses including permanent plantings, and to provide approved appraisers with a base level of understanding for the cranberry industry.

In New Jersey, there has been relatively little sales history over the last several years. Indeed, major reliance must be placed on the sales activity in the State of Massachusetts in order to produce credible appraisals. The information that is included in this section demonstrates the interdependency of the markets from one region to another in the industry. The cranberry industry, by reason of its specialty nature, presents a very unique and specialized appraisal problem.

Valuation of cranberry property in the Pinelands requires an appraiser with an understanding and knowledge of the total cranberry industry. This is partially a result of the nature of the industry, one that is relatively small and one that is truly a national market rapidly becoming an international market. The lack of sales activity in New Jersey is the other primary reason an appraiser has to have an intimate familiarity with the national industry and its influences. Traditionally, the market values of cranberry production units in New Jersey have reacted in tandem with the values in the cranberry production areas of Massachusetts, albeit at slightly lower levels. Analysis of sales data gleaned from other production areas provides significant information to be used in the valuing of New Jersey properties. Specifically, relative price levels of bog properties, discount and yield rates, depreciation rates, and multipliers and factors can be derived from sales in other areas and used to value New Jersey properties.

Table No. 7 on the following page provides an overview of the price and production history of the cranberry industry over the last 6-years. However, one must look at the industry over an extended period, and in a slightly different way, to get a true representation of the forces impacting the industry today.

The state of today's cranberry industry has been building for several years. Tables No. 8 and 9 provide a summary of Cranberry Production, Sales, and Inventory, as compiled by the Cranberry Marketing Committee, for the last several years.

The following table presents an overview of the relationship of the New Jersey cranberry industry to that of the US:

Table 7

ITEM AND AREA	1995	1996	1997	1998	1999	2000
Acres Harvested						
New Jersey	**1,700**	**3,600**	**3,900**	**3,900**	**3,900**	**3,700**
Massachusetts	13,500	14,200	14,600	14,400	14,800	13,900
Oregon	3,500	1,800	2,000	2,200	2,300	2,300
Washington	1,500	1,500	1,500	1,600	1,600	1,600
Wisconsin	11,500	12,900	13,700	14,500	14,600	15,100
United States	31,700	34,000	35,700	36,600	37,200	36,600
Total Production (Barrels)						
New Jersey	**170,000**	**467,000**	**582,000**	**521,000**	**696,000**	**490,000**
Massachusetts	1,600,000	1,722,000	2,100,000	1,875,000	1,886,000	1,850,000
Oregon	445,000	312,000	350,000	355,000	320,000	365,000
Washington	177,000	180,000	165,000	168,000	147,000	176,000
Wisconsin	1,725,000	1,990,000	2,300,000	2,525,000	3,340,000	2,658,000
United States	4,117,000	4,671,000	5,497,000	5,444,000	6,389,000	5,539,000
Production per Acre (Barrels)						
New Jersey	**100.00**	**129.7**	**149.2**	**133.6**	**178.2**	**132.4**
Massachusetts	118.50	121.3	143.8	130.2	127.4	133.1
Oregon	127.10	173.3	175.0	161.4	139.1	152.1
Washington	118.00	120.0	110.0	105.0	92.0	117.3
Wisconsin	150.00	154.3	167.9	174.1	228.8	176.0
United States	129.90	137.4	154.0	148.7	171.7	151.3
Farm Price (Dollars per Barrel[9])						
New Jersey	**$46.80**	**$61.80**	**$56.60**	**$26.30**	**$10.90**	
Massachusetts	50.60	70.90	66.20	37.30	16.80	
Oregon	46.60	60.50	55.70	39.80	10.50	
Washington	46.30	61.00	55.70	25.00	12.80	
Wisconsin	49.50	63.80	65.00	43.30	20.60	
United States	$49.30	$65.90	$63.70	$38.80	$17.70	

Source: New England Agricultural Statistical Service, Ag-Review, 1/98, 1/99, 1/00

[9]Equivalent returns at first delivery point, screened basis of utilized production, weighted average of independent and cooperative prices.

Table 8

Cranberry Production, Sales, and Inventory Statistics 1987-1999
(Production in Barrels)

Crop Year	Beginning Inventory	Inventory Adjustments	Domestic Production	Percent Change	Foreign Production	Percent Change	Total Production	Percent Change	Total Supply	Percent Change
1987	783,554	44,654	3,313,115		256,971		3,570,086		4,398,294	
1988	818,001	65,772	4,069,935	22.84%	287,009	11.69%	4,356,944	22.04%	5,240,717	19.15%
1989	913,141	72,311	3,732,117	-8.30%	254,927	-11.18%	3,987,044	-8.49%	4,972,496	-5.12%
1990	838,791	378,196	3,403,441	-8.81%	379,782	48.98%	3,783,223	-5.11%	5,000,210	0.56%
1991	771,487	489,558	4,173,775	22.63%	426,010	12.17%	4,599,785	21.58%	5,860,830	17.21%
1992	1,136,472	14,926	4,103,005	-1.70%	463,667	8.84%	4,566,672	-0.72%	5,718,070	-2.44%
1993	1,383,406	44,839	3,909,085	-4.73%	374,013	-19.34%	4,283,098	-6.21%	5,711,343	-0.12%
1994	1,189,257	24,666	4,667,629	19.40%	572,830	53.16%	5,240,459	22.35%	6,454,382	13.01%
1995	1,186,737	69,811	4,182,947	-10.38%	574,656	0.32%	4,757,603	-9.21%	6,014,151	-6.82%
1996	888,395	95,463	4,668,479	11.61%	511,273	-11.03%	5,179,752	8.87%	6,163,610	2.49%
1997	1,221,319	30,649	5,480,360	17.39%	476,902	-6.72%	5,957,262	15.01%	7,209,230	16.96%
1998	2,037,441	158,342	5,463,594	-0.31%	608,876	27.67%	6,072,470	1.93%	8,268,253	14.69%

Table 9

Cranberry Production, Sales, and Inventory Statistics 1987-1999
(Production in Barrels)

Crop Year	Fresh Sales (Domestic)	Fresh Sales (Foreign)	Processed Sales (Domestic)	Processed Sales (Foreign)	Total Sales	Percent Change	Shrinkage	Ending Inventory (Aug. 31)	Percent Change
1987	263,916	46,414	3,021,420	66,425	3,398,175		182,118	818,001	
1988	253,597	130,596	3,693,561	53,300	4,131,054	21.57%	196,522	913,141	11.63%
1989	234,210	123,630	3,433,799	68,436	3,860,075	-6.56%	273,630	838,791	-8.14%
1990	164,998	104,659	3,665,882	95,791	4,031,330	4.44%	197,634	771,487	-8.02%
1991	173,861	66,434	4,173,095	136,235	4,549,625	12.86%	174,733	1,136,472	47.31%
1992	204,648	34,199	3,755,315	176,136	4,170,298	-8.34%	164,366	1,383,406	21.73%
1993	210,090	19,126	3,878,172	263,589	4,370,977	4.81%	151,109	1,189,257	-14.03%
1994	230,850	18,474	4,461,657	342,604	5,053,585	15.62%	214,060	1,186,737	-0.21%
1995	216,558	22,557	4,161,843	374,468	4,775,426	-5.50%	350,330	888,395	-25.14%
1996	213,542	19,726	4,071,969	466,000	4,771,237	-0.09%	171,054	1,221,319	37.47%
1997	205,595	22,835	4,343,872	513,172	5,085,474	6.59%	86,615	2,037,441	66.82%
1998	191,690	51,615	4,314,942	516,667	5,074,914	-0.21%	86,063	3,107,366	52.51%
1999					-				

The tables on the two preceding pages point out the basic influences on today's cranberry prices at the farm level. Over the last 12 crop years, total domestic and foreign cranberry production has increased an average of 4.95% annually (compounded). During the same period, total utilization of the crop has increased an average of 3.71% annually (compounded). The net result has been an oversupply of cranberries as evidenced by an ending inventory that has grown from 818,001 barrels as of August 31, 1987 to 3,107,366 barrels as of August 31, 1998. This is an average annual increase of 12.90% (compounded). When the 1999 crop of 6,389,000 barrels is considered along with an average utilization increase of 3.71%, the inventory increases by an estimated 1,125,000 barrels to about 4,230,000 barrels. It is obvious that the economic pressures being exerted on cranberry prices will not be relieved in the short run. Indeed, many growers and handlers of cranberry products have indicated that a three to five year period of stress lies ahead.

One of the primary factors influencing the growing supply of berries in the U.S. has been the change in cranberry acreage. Table 10 provides a summary of acreage increase in the U.S. since 1988.

Table 10

Harvested Acres 1998-2000 Crop Years
Projected 2001-2002 Crop Years

Year	Harvested Acres	Percent Change	Average Yield (Bbls/A)	Percent Change
1988	26,755		152.00	
1989	27,236	1.80%	137.03	-9.85%
1990	27,494	0.95%	123.79	-9.66%
1991	28,310	2.97%	147.43	19.10%
1992	29,564	4.43%	138.78	-5.87%
1993	31,013	4.90%	126.05	-9.17%
1994	31,279	0.86%	149.22	18.38%
1995	34,229	9.43%	122.20	-18.11%
1996	34,084	-0.42%	136.97	12.09%
1997	35,696	4.73%	153.53	12.09%
1998	36,450	2.11%	149.85	-2.40%
1999	37,200	2.06%	152.87	2.02%
2000	36,600	-1.61%	151.30	-1.03%
2001	41,458	13.27%	168.88	11.62%
2002	42,529	2.58%	172.65	2.24%

(The projected yield per acre is based on new acreage entering production at a level of 150 barrels per acre.)

The average annual (compounded) increase in producing acres in the U.S. has been about 2.78% since 1988. It is projected to be about 3.40% for the period of 1999 through 2000. Over the same time periods, production per acre has increased about 1% annually (compounded) and is projected to increase by about 3.0% per year (compounded)

Table 11 provides an overview of cranberry prices, as reported by the USDA/NASS for the period 1992 through 1999. The 2000 crop price will not be established until the close of the market pool, sometime in late 2001 or early 2002.

Table 11

AVERAGE PRICE PER BARRELL				
1992-1999 CROP YEARS				
YEAR	**U.S. PRICE/BBL**	**PERCENT CHANGE**	**NJ PRICE/BBL**	**PERCENT CHANGE**
1993	$50.50	N/A	$47.20	N/A
1994	$49.30	-2.38%	$46.60	-01.27%
1995	$43.40	8.32%	$46.80	+0.004%
1996	$65.90	23.41%	$61.80	+32.05%
1997	$63.70	-3.34%	$56.60	-8.41%
1998	$41.60	-34.69%	$26.30	-53.53%
1999	$17.70	-57.45%	$10.90	-27.35%

The primary purchaser/processor of cranberries in the United States, and in New Jersey, is Ocean Spray Cranberries, Inc. The cooperative purchases the cranberries from member-producers for a combination of cash payments and stock payments. The compensation has typically been distributed over an approximate 16-month period. The cooperative announced that the pool payout would be extended beginning with the 1999 crop pool.

The previous tables provide a detailed summary and overview of the cranberry industry, both nationwide and in the State of New Jersey. They are intended to provide the reader with a prospective of the relationship of the State's industry to the overall national cranberry industry.

Northland Cranberries, Inc. (“Northland”) is the largest publicly held cranberry producing and processing company in the industry. Headquartered in Wisconsin, Northland controls about 25% of the cranberry crop.

Ocean Spray Cranberries, a farmer owned agricultural cooperative, continues to dominate the cranberry markets. To understand better how the industry is likely to fare in coming years, it is necessary to understand what the strategies of Ocean Spray might be.

In a 2000 memorandum to growers, John Wilson, director of grower relations of Ocean Spray said the following; "During the July grower meetings, it became clear to all of us that the surplus is significant and that we need a plan to manage it. Ocean Spray enters the new fiscal year with about 1.5 million barrels of cranberries (in various forms such as concentrate and frozen) more than is required to meet present business needs. Without future volume regulation about 300,000 barrels will be added to that surplus each year for the next 4-5 years.

A cross-functional team has made recommendations to manage our crop supply for this year and for the future. The team looked at a number of issues which included 1) identifying the scope of the surplus, 2) assessing how much fruit could be removed from the system this year, 3) determining the impact to the pool and ultimately, 4) determining the impact to you, the grower. This fall, harvest 2000, we will not be disposing of paid barrels of fruit. Destroying as little as 300,000 paid barrels this fall could reduce the 2000 Pool return by $2.00 per barrel. Given the present difficult situations of our growers, I don't see how we can lower the grower return more than it already is."

There are several causes of the current surplus problem. Higher than typical grower returns induced industry expansion, both from new and existing growers. For a period of time this did not have a negative effect on prices because demand for cranberries was expanding more rapidly than production. This situation changed in the middle to late 1990's when production began to significantly exceed demand.

Much of the increased demand in the early years came from heavier use of cranberries in blended juices. After a period good juice sales and high berry prices in the mid-1990's, many juice blenders altered their juice formulations to use less cranberry juice, substituting cheaper juices like apple and pear. In effect, this "shifted" the demand for cranberries backwards, putting further downward pressure on prices.

The effect of the surplus on the price for cranberries is a classic case study in supply and demand. The price per barrel for cranberries rose steadily from the mid 1970's until approximately 1997 when it topped out at approximately $66 (paid by Ocean Spray in 1997 for the 1996 crop). Just prior to the delivery of the 1998 harvest, Ocean Spray projected the per-barrel price at approximately $61.53 per barrel.

Fruit typically is delivered in October and payments on the pool are typically received through the following growing year at approximately two-month intervals, with the final payment being in November or December of the following year. This is an approximate 13 to 14-month pool payout period.

In early 1998 rumors began circulating that the Cooperative's pool was not going to make the $61.53 goal for the 1997 crop (delivered in 1997 and paid in 1998). At first the rumors were that the pool was not going to close out above $50.00. This was a shock to many growers, as the price had not dropped significantly for more than twenty years. Many growers had already made financial plans based on the $61.53 goal that had presented by the company just prior to the 1998 harvest.

By about March of 1998 it became apparent that the pool might not close out above $40.00. This decline of the pool price continued through the year. The projected proceeds on 09/12/99 were given as a RANGE of $32.00 to $38.00. This further declined with a revised 1998 pool estimate of $28.98. The pool finally closed at or near $28.90.

In 2000 growers were notified that the 1998 pool had closed out with an over-distribution in excess of $8.25. In other words, growers had been paid $8.25 more than the pool had made. The actual pool proceeds were $20.73. Rather than ask for the money back, which most growers could not afford, Ocean Spray's current plan is to recover the $8.25 overpayment out of the proceeds of the next four or five years at the rate of approximately $2.00 per year. An over-distribution like this has only happened one other time in the history of the cooperative.

Just prior to harvest of 1999 the proceeds for the pool for the 1999 crop were estimated to be approximately $20.00 to $30.00. An advance payment of $5.00 was received on delivery. Other advances were received in the year 2000 with a total of $10.78 per barrel paid out through March of 2000 for the 1999 crop.

In April 2000, Ocean Spray notified growers that no more proceeds were going to be paid on the 1999 crop until it was finalized sometime in mid 2001. As related above, the total proceeds paid to that time on that crop were $10.78. It is expected that the net income to the growers out of the final payment in 2001 (to come maybe sometime in July of 2001) will be in the neighborhood of another $1.00 or $2.00 (exclusive of the proportional recapture of the 1998 crop pool overpayment).

The price forecast by Ocean Spray through crop year 2002 is presented in Table 12.

Table 12

Crop Year	CY 2000	CY2001	CY2002
February Advance	$ 2.00 (99 Pool)	$ 2.00 (2000 Pool)	$ 2.00 (2001 Pool)
March Incentives	$ 2.79 (99 Pool)	$ 2.79 (2000 Pool)	$ 2.79 (2001 Pool)
April Advance	$ 1.00 (99 Pool)	$ 1.00 (2000 Pool)	$ 1.00 (2001 Pool)
June Final 1999 Payment		$ 0.00 - $3.45	
August Advance		$ 1.00 (2000 Pool)	$ 1.00 (2001 Pool)
September Advance		$ 1.00 (2000 Pool)	$ 1.00 (2001 Pool)
October Final 2000 Payment			$ 7.21-$12.21 (2000 Pool)
October Harvest Advance	$ 5.00 (2000 Pool)	$ 5.00 (2001 Pool)	$ 5.00 (2002 Pool)
Total Receipts	$10.79	$12.79 - $16.24	$20.00 - $25.00

In a memorandum to growers Ocean Spray indicated that Ocean Spray is NOT projecting that the cash payments will stay at the $10 per barrel level for the next five years. The memorandum goes on to say: "…the odds of improving the cash payment in year four (calendar year 2003), should increase if we are successful in delivering the projected book return of $24 to $29 per barrel for the 2000 Pool. Having said that, it is important to remember that these cash payment projections represent the best estimates that we have today on a crop that is still to be harvested. As they would say in a publicly traded company, these cash projections are "forward looking information" and actual results may be materially different from the projected results."

While the projected income range as presented above for the calendar year of 2001 is better than the income received in 2000 for the 1999 crop, this still is below the cost of production experienced by most growers.

The most recent data available indicates that the amount that will likely be paid to growers for the 2000 crop is between $10 and $15 per barrel.

To attempt to alleviate the oversupply problem the Cranberry Marketing Committee introduced a mandatory (for US growers) 15% crop reduction for the 2000 crop. A mandatory 35% reduction has been instituted for the 2001 crop with a goal of limiting cranberry production to 4.6 million barrels for the upcoming season.

The Cranberry Marketing Committee is a government organization that was created in the 1960's to regulate the cranberry industry in just such an oversupply situation as now exists. Under the current plan, a grower can only deliver 85% of his/her most recent three-year production average. Also, any farm that produced less than 50 barrels per acre will not be allowed to deliver.

It is possible to apply for a larger quota, however additional quota will be distributed based on state average production. This is considerably below the production rates of most new producing acreage that has been planted with hybrid vines. This has placed many farmers with new farm sections (just coming into production) in a position where they will have to dispose of large quantities of berries (dump them) that they are unable to sell under the terms of the marketing agreement.

Conclusion

The precipitous decline in income resulting from the sale of the 1999 crop as well as subsequent crops has caused major upheaval in the cranberry industry. Sales of cranberry farms in all growing regions have nearly stopped due to the lack of demand caused by the current industry flux. Many farms are available and on the market - formally or informally - but there has been little serious interest by purchasers as most are waiting out the current troubles to see what the future may bring.

While many growers listened with dismay to predictions of $20.00 to $30.00 per barrel returns a year ago, almost all now look forward to that same range for the next year. This range, however, will not be enough in the long run. The consensus is that returns will have to grow to the $35 range for many farms to break even.

Also to be considered is efficiency. Per-acre production is a major component of the efficiency formula. Some production areas are at a distinct advantage in terms of production efficiency. Wisconsin has about 40 percent of the total producing acres of cranberries in the U.S. It produces nearly 53 percent of the berries grown in the country. The cranberry “marshes” being constructed in Wisconsin have several advantages. They are relatively large, are typically long and narrow (125’ – 250’ x ¼ mile – approximately), generally are planted with the latest hybrid varieties that can be expected to produce in the range of 200 barrels per acre and more, are generally level and concentric in their layout, and are constructed on land that is somewhat less expensive than that in other growing areas.

Table 13 summarizes the production of cranberries in the several U.S. Growing areas over the period of 1995 through 1999.

Table 13

Production per Acre (Barrels)						
State	**1995**	**1996**	**1997**	**1998**	**1999**	**5-Yr. Average**
Wisconsin	150.00	154.3	167.9	174.1	228.8	**175.02**
Oregon	127.10	173.3	175.0	161.4	139.1	**155.18**
New Jersey	*100.00*	*129.7*	*149.2*	*133.6*	*178.2*	***138.14***
Massachusetts	118.50	121.3	143.8	130.2	127.4	**128.24**
Washington	**118.00**	**120.0**	**110.0**	**105.0**	**92.0**	**109.00**
United States	**129.90**	**137.4**	**154.0**	**148.7**	**171.7**	**148.34**
Difference: NJ vs. US	***-23.02%***	***-5.60%***	***-3.12%***	***-10.15%***	***+3.79%***	***-6.88%***

As is demonstrated in this table, not only has Wisconsin developed a larger production base, its production average(s) have been steadily increasing through the late 1990's. The other producing areas have all had considerable fluctuation in their production history over the same period. However, the trend is upward. It is the producers that can meet and exceed their state's average production that are likely to be the survivors through the difficulties being experienced by the industry.

The table also demonstrates the State of New Jersey's competitive position in terms of production. Other producing areas of the U.S., most notably Wisconsin and Oregon, are increasingly dominated by the higher producing hybrids including the Stevens, Ben Lear, and Pilgrim varieties.

An overview of trends in cranberry acreage sales is also important to look at. In all producing areas of the U.S. there has been a decided downward trend in sale prices since early 1999. In Massachusetts total decline is about 45% from peak values. In Wisconsin, there are indications that the decline is at or slightly greater than 50% from peak values. (Anecdotally, the decline may be as high as 70% based on a rumored sale of a property at $70,000 per bog acre (+/-); the sale has not been confirmed.) In Oregon, the decline is documented to be up to 60% and in the State of Washington the decline is about 47%. In the State of New Jersey there have been no sales in the recent past with which to measure the amount of any price decline. However, the State's market value levels have always closely mirrored those of Massachusetts.

There are several attributes of cranberry production that must be considered in the valuation process. They include: water supplies; sand supplies; varieties of cranberry vine; age of cranberry vine; vitality and vigor of vines; drainage characteristics; marketing (cooperative vs. independent); configuration, shape, and topography of bogs; support facilities (screenhouses, machinery storage, irrigation systems, etc.); and location relative to markets.

Cranberry beds range from less than one acre to several acres in size. Dikes subdivide large beds into smaller sections to facilitate management. Usually, a large main ditch traverses the bog. In addition, marginal ditches protect the bogs from upland growth and hasten flooding and drainage. These ditches are especially helpful in large beds. During the growing season water

impounded in the ditch system may be used to supply the plats with essential irrigation water. On the other hand, contaminated water can be impounded for several days to allow degradation.

Sprinkler (irrigation) systems are used in modern cranberry culture for irrigation, to protect buds or fruit against frost damage, to apply agricultural chemicals using chemigation units, or to cool a bed in hot summer weather. Use of sprinklers conserves water and provides the desired effects faster than the technique of flooding the bogs, which was the practice prior to the early 1970's.

Cranberry bog soil is unique because it consists of alternating layers of sand and organic matter. Dead organic matter (leaves and trash) accumulates over the course of time; in addition the bog is sanded every two to four years to maintain productivity. In contract to regular agricultural soils, cranberry bog soil needs no tilling, remains undisturbed, and little mixing of sand and organic matter takes place.

The cranberry plant becomes dormant in the winter. A common practice is to flood cranberry bogs to prevent winterkill.

Water is an important requisite to growing cranberries. It seems perplexing that large amounts of water are needed to grow a plant that grows on wetlands. However, cranberries grow on the uppermost layer of the bog and are separated from the groundwater. Cranberry vines have a shallow root system (about 4-inches deep) and are unproductive without irrigation.

"Wet" cranberry beds must be managed so that the water level is not sustained around the root zone for long periods of time. In extremely rare cases, the bog water level may be close enough to the root zone to require frequent drainage.

Water is used in cranberries for irrigation, to apply agricultural chemicals, to protect plants and fruit from frost in the spring and in the fall, to control pests and weeds without chemicals, to harvest berries, to cool the bog during the summer, to remove organic debris, and to provide a protective flood. Rough estimates of the amounts of water requisite to grow cranberries are given in the table 14.

Table 14

Management Practice	Flood: Acre-Foot	Sprinkler: Acre-Foot
Winter flood	2.0	2.0
2nd Flood (if needed)	1.0	1.0
Frost Protection	4.9	1.7
Application of Chemicals	0.0	0.3
Irrigation	25.	0.8
Water Harvest	2.0	2.0
Total	12.4	7.8

Irrigation water is supplied either through sprinkler systems or by raising the water table in the irrigation ditches. Irrigation water supplied in ditches penetrates through the sidewalls into the bog. When the water table in the ditches is lowered, excess water from the bog will drain into the ditches.

Sand is another important factor to be considered in valuing cranberry bogs. Every few years, one half to one inch of sand is applied to cranberry bogs as an essential part of good bog management. Sanding can be applied directly to the vines in the spring or fall. The location of New Jersey's bogs generally eliminates the potential to apply the sand during the winter over an ice covering. To sand, most growers use specialized sanders usually that they have built themselves or they may use helicopters. In New Jersey, most sanding is from barge sanding machines.

Sanding is a cultural practice that stimulates new vine growth, suppresses insects, improves drainage of surface water, and helps to hasten the breakdown of the trash layer making more nutrients available.

It is typical in the industry for a relatively small production unit to require a substantial total acreage because of the need for water and sand. Cranberry farms in New Jersey can vary in size and proportion, but generally it can be said that from 5- to 15-acres of support land is requisite for each acre of producing cranberries. This results in a production to support ratio of between 1:10 and 1:15.

Cranberry producers purchase their units based on producing acreage, but assume that a reasonable amount of support land is included to provide adequate water and sand storage. The most significant aspect is the water storage and watershed that generally accompanies cranberry acreage. Adequate water storage and supply is an absolute requirement for cranberry production. Sand, unlike water, which can be purchased off-site, is also critical, but not as critical for this reason.

The appraiser, however, must research the market area to determine the appropriate range of production acreage to upland ratios to be considered. The value of this support land is then included as part of the value of the producing acreage. For example: a cranberry farm with a total of 250 acres including 20-acres of bog would have a ratio of 1:11.5. If it was determined that the producing acreage had a value of $15,000 per bog acre the value would be reported as follows:

Property Value: $300,000
or
$15,000 per Bog (Producing) Acre
or
$1,200 per Total Acre

Vining and vine varieties greatly influence cranberry bog values. Some bogs may be planted to so-called older varieties including Early Black, Howe, or McFarland. These varieties, while still in production have relatively low yields. On the other end of the production spectrum are the newer, hybrid vines including Stevens, Ben Lear, and Pilgrim. It is not uncommon for these varieties to yield 200 barrels per acre or more. There have been anecdotal reports of some newer varieties producing up to 400 to 500 barrels per acre.

As was pointed out previously in this section, cranberry prices have a direct affect on price and value levels of bog properties. Therefore, it is reasonable to conclude that the higher the production, the greater the property value. Vine density is also a consideration in valuation. The greater the density, generally, the higher the production level. A bog with a low density and significant bare spots resulting from the low density and/or disease would presumably have a lesser value than one with good vining characteristics.

The marketing of berries may have an impact on bog price levels. The appraiser should be aware of the type of marketing employed by the grower: via cooperative (Ocean Spray) or via independent handler and is the fruit grown and harvested for fresh fruit or for processed fruit.

Fresh fruit is harvested almost exclusively via dry harvest while processed fruit is generally harvested via water harvest techniques. The two techniques have decidedly different cost and income structures and have differing impact on the vines, particularly in the aspect of training the vines for harvest. The appraiser must be able to recognize what, if any, impact the method of marketing and harvesting of the crop has on the property's value.

The configuration, size, and shape of cranberry bogs are gradually being elevated in importance as an element of value. As the industry continues to deal with surplus production, those producing units that are most efficient will have the greatest value. As an example, Wisconsin production units are generally laser leveled, are rectangular in shape (generally about 125' or 250' in width and about ¼ mile in length), and predominately farmed from their ditches. In contrast, the bogs in New Jersey and Massachusetts tend to be of irregular shape, may have extreme elevation changes from one end or side to another, and must generally be farmed from their production surfaces. It is generally recognized that the older properties such as are found in New Jersey and the northeast are less efficient production units and may be less desirable. However, if a unit has been recently rehabilitated and steps taken to improve operational efficiency, that unit may command some premium in the market.

Finally, support facilities are important to bog value. While cranberry cultivation is not generally machinery intensive, it does require significant investment in specialized equipment, including maintenance, harvesting, transportation, and irrigation equipment. Most bog units have support facilities designed to accommodate this equipment. The market appears to recognize quality and utility in the improvements and will reward the property that has the greatest utility and quality of improvements while not having an imbalance between its productive acreage and its storage capabilities. There are generally no on-farm fruit storage facilities on cranberry farms.

BLUEBERRIES

Blueberries and cranberries are the only two commercially cultivated fruit crops native to North America. Three major cultivated types of blueberries exist: the lowbush blueberries of Maine and eastern Canada, the rabbiteye blueberries of the Deep South, and the Highbush blueberries native to the eastern United States. Hybrids between these groups are also grown commercially.

Blueberries are sold fresh or frozen, or processed into jelly, juice, and dessert fillings. The ability to shift production to either the fresh or processing markets has resulted in relatively high, stable prices for growers. Blueberries have relatively few pest problems, so once the planting is established; maintenance costs tend to be lower than for many other fruit crops.

Many factors must be considered prior to establishing a blueberry planting. The first is marketing; without a market, no profit can be made. Second is economics, especially during the long payback period. The third, and final consideration is producing a crop.

Mature highbush plants are 6 to 8 feet tall. Several canes are produced from the crown each spring, and canes live for many years. Flower buds form in the fall, and plants produce fruit about 2 months after flowering in the spring. Yields have been reported to be more than 25,000 pounds per acre, although more typical yields in a well-managed commercial planting range from 4,000 to 6,000 pounds per acre.

The success of blueberries has been dramatic. The acreage planted to blueberries has increased faster than for any other temperate fruit crop. In 1930 about 200 acres were cultivated; today, more than 40,000 acres are cultivated in North America alone. The largest highbush production regions in North America are Michigan, New Jersey, the Pacific Northwest, North Carolina, the south central states, and the northeastern states. Europe, West Germany, France, Poland, and southern England have young industries. In the Southern Hemisphere, South Africa, New Zealand, Australia, and Chile also produce blueberries. The highbush industry in North America is worth more than $100 million as Americans consume nearly 200 million pounds of blueberries a year.

The following table highlights highbush blueberry commercial production in the U.S. for 1989, the last year for which consolidated information is available.

Table 15

State	Acres	Production (Millions of Pounds)
Michigan	15,100	60.1
New Jersey	9,700	40.0
North Carolina	4,300	10.0
Oregon	1,370	11.2
New York	1,000	7.0
Washington	900	6.3
Georgia	850	2.6
New England[10]	1,250	4.5
Others[11]	4,680	15.0
Total U. S.	39,150	156.7

Selecting a good site for blueberry planting is important. The high establishment costs and potential longevity of the planting make this decision crucial. Blueberries have more specific site and soil requirements than most other crops.

A growing season of at least 160 days is required for sustained crop production. Temperature moderation, to avoid the impact of heavy frost action, can be achieved by planting near large bodies of water, by planting on north- or east- facing slopes, delaying flowering, and reducing susceptibility to frost damage. Plants on such slopes are less vulnerable to desiccating western winds. Blueberries grow best in climates that have warm, sunny summers. Cool, cloudy summers reduce the quality of the fruit and favor the spread of fusicoccum canker. Hot summers can decrease fruit flavor and firmness.

In North America, the blueberry is not generally successful north of a line connecting: Muskegon, MI; Saginaw, MI; Toronto, ONT; Oswego, NY; Rutland, VT; Portland, ME; and Halifax, Nova Scotia.

[10] Includes CT, MA, ME, NH, RI, VT

[11] Includes AR, MO, OK, PA, KY, SC, MD, VA, FL, IL, IN, OH

Blueberries grow best in well-drained, acid, sandy loams with an organic matter greater than 3.0%. The ideal soil pH is about 4.5, although they will tolerate a pH between 3.8 and 5.5 if the organic matter content is high. Growing blueberries in less acid soil will result in nutrient deficiencies.

The plant has a shallow root system that is susceptible to drought, yet the roots cannot tolerate standing water. Good soil drainage is an essential factor for successful production. After heavy rain, the water table should recede to at least 8 inches within 24 hours. Standing water during the spring and summer reduces the amount of oxygen in the soil and kills the growing parts of the roots. Standing water in the winter causes plant heaving, which further damages the root system.

Most natural berry soils have a low water-holding capacity because of their high sand content. Supplemental irrigation is nearly always essential for successful production, especially when planting on raised beds.

Air drainage is the movement of heavier, colder air to lower elevations. If the site is in the northern growing region, then slopes with good air drainage will help prevent winter injury. Under certain conditions, open flowers can tolerate temperatures as low as 23^{O}F. The earliest flowering varieties are most susceptible to frost injury.

The location of the planting determines to a great extent the type of marketing that can be considered. Most natural blueberry soils are not near major metropolitan areas, so prepicked fruit for fresh market and mechanically harvested fruit for processing are the major options. Closer to cities, pick-your-own (PYO) operations should be considered. The trade area for PYO blueberries seems to be larger than the 20-mile radius documented for strawberries. If the public will harvest the planting, then site plans must include a parking area and restroom facilities.

Table 16, on the following page, summarizes important characteristics of selected highbush blueberry varieties that may be grown in the northern climates, generally known as Northern Highbush varieties. A complete and detailed description of the varieties is found in the *Highbush Blueberry Production Guide*, Cooperative Extension, NRAES-55, Northeast Regional Agricultural Engineering Service, Ithaca, New York.

Table 16

Important characteristics of selected highbush blueberry varieties.[1]

Variety	Fruiting Season	Yield Potential	Fruit Size	Scar	Firmness	Flavor	Winter Hardiness
Angola	1	1	1	1	1	3	2
Berkeley[2]	3	2	3	1	3	2	3
Bluechip	2	3	4	3	4	3	2
Bluecrop[2]	3	3	4	4	4	3	4
Bluegold	4	3	2	3	3	3	4
Bluehaven	2	2	3	3	3	3	2
Bluejay[2]	2	2	3	4	4	3	4
Blueray	2	3	4	2	3	3	4
Blueetta[2]	1	2	2	1	2	2	3
Bounty	3	3	3	3	3	1	2
Collins[2]	2	2	3	3	3	3	4
Concord	3	2	1	1	2	4	3
Coville[2]	4	2	4	2	3	3	3
Croatan	1	4	2	1	2	2	2
Darrow	3	1	4	3	3	4	3
Dixi	3	3	4	1	2	3	3
Duke[2]	1	3	3	3	3	2	4
Earliblue[2]	1	2	3	2	2	1	3
Elizabeth	4	2	3	3	3	4	4
Elliott[2]	4	4	2	3	4	2	4
Harrison	1	3	4	2	3	2	2
Herbert[2]	4	2	4	2	2	4	4
Ivanhoe	3	2	1	2	3	4	3
Jersey[2]	4	3	2	2	3	2	4
Lateblue[2]	4	3	3	3	3	3	4
Meader	2	2	2	4	3	2	4
Morrow	1	2	2	1	2	2	2
Murphy	2	2	2	1	3	2	2
Nelson	3	3	4	4	3	4	4
Patriot[2]	2	2	3	3	3	3	4
Pemberton	3	3	3	1	2	2	4
Rancocas	2	2	1	2	3	2	4
Rubel[2]	3	2	1	2	3	2	4
Sierra	3	3	3	3	3	2	3
Spartan[2]	2	3	4	2	3	4	4
Stanley	2	2	1	1	3	4	4
Sunrise	1	3	2	3	2	3	4
Toro[2]	3	3	3	4	3	3	4
Weymouth	1	2	2	2	1	1	4
Wolcott	1	2	2	3	2	2	2

[1] Fruiting season (1-4, early to late); Yield potential (1-4, low to high); Size (1-4, small to large); Scar (1-4, large to small); Firmness (1-4, soft to firm): Flavor (1-4, weak to excellent); Winter hardiness (1-4, limited to very hardy).

[2] Variety is suitable for mechanical harvest.

The most recently released blueberry varieties that are suited to the northern climes include: Bluegold, Blue Rose, Brigatta Blue, Caroline Blue, Denise Blue, Duke, Nelson, Nui, Puru, Reka, Sierra, Sunrise, and Toro.

Appraisers must evaluate both the varietal mix on a property and its production relative to the overall marketing year of the product. For example, a planting with a mixture of Weymouth, Duke, Bluecrop, and Elliot bushes will provide production throughout the marketing season. (Weymouth is an early season variety; Duke is an early to mid season variety; Bluecrop is a mid season variety; and Elliot is a late season variety.)

Blueberry plantings need to be planned to use land efficiently; accommodate equipment for pest control, mowing and harvest; and provide for the cross-pollination needs of the varieties selected. Plant densities of 870 (5' x 10') to 1,089 (4' x 10') plants per acre are common in commercial plantings. Adequate spacing provides access for mowing, pest control, pruning, and harvest. Uniform plant spacing is important. If the planting will be harvested PYO, then rows should be between 200' and 250' so customers do not have to carry fruit long distances.

Pruning is required to maintain the vigor and productivity of bushes, and to develop an appropriate growth habit for harvesting. Pruning reduces fruit numbers and permits sunlight to reach further into the canopy, thereby improving the sweetness and size of fruit. Proper pruning will allow for the elimination of older, less productive canes and rejuvenation of new cane growth, which is essential for stable production.

Annual pruning is essential. Bushes tend to produce new canes the year after pruning; regular, moderate pruning encourages continuous regeneration, a constant proportion of fruiting wood, and steady yields.

Mulch should be maintained at 3 to 5 inches in a 3-to 4-foot band centered under the plant. It should be replenished every 2 to 3 years.

Damage to blueberries by birds is a serious problem. Recent studies estimate that as much as 30% of the crop is lost to birds in some years. Robins, common grackles, and starlings most frequently cause damage, although other songbirds have caused significant fruit losses in some areas. Some large birds eat the berries directly, but much of the loss occurs when foraging birds knock the fruit off the bush. Some smaller birds puncture the fruit, creating a rot problem, which can seriously jeopardize the quality of a pack. Punctured fruit is difficult to detect during harvesting and sorting operations.

Netting is the most complete and effective method for controlling bird damage to fruit crops. The cost of netting varies considerably with the type, manufacturer, and quality. The initial cost of netting may be quite high, but it can be prorated over the 3 to 10 year life expectancy of the material. The labor cost for installation and removal of netting is high.

Sounds may repel birds and other predators. However, after time, most animals adjust to and ignore new sounds through habituation. Growers with plantings near urbanized areas may experience conflicts with homeowners if sound-producing devices are used. In these areas growers may want to consider less offensive bird damage management techniques such as visual frightening devices and/or traps.

Currently there are no chemical repellents registered for protecting blueberries from avian damage. Until 1988, bird problems in most fruit crops were resolved by spraying the fruit with methiocarb (Mesurol). A review of the Mesurol toxicology data by the U.S. Environmental Protection Agency resulted in a reduction in the tolerance level from 100 ppm to 5 ppm in harvested fruit. Consequently, Mobay Chemical Corporation deleted cherries, blueberries, and peaches from the Mesurol label. At the present time, there is no indication that this chemical will again become available for use as a bird repellant.

Other nuisance wildlife that impact blueberries includes: Deer, Voles, and Woodchucks.

Water is essential to producing a profitable blueberry crop. Supplying sufficient water and removing excess water should be goals of the blueberry grower. The importance of water to a growing crop and the uncertainty of rainfall over time and locations make water management an important factor for blueberry production.

Blueberries are often associated with swamps or bogs and are believed to be tolerant of wet conditions. In bogs, however, the berries grow on hummocks and other areas that are above the water level. They are found in wetlands, not because they require wet conditions, but because they can compete effectively with other plants in nutrient-poor environments. Blueberries grow best in moist, but not saturated soils.

In blueberries, waterlogged conditions during the periods of rapid growth (March through May and October through November) are especially detrimental. The symptoms of excessive water are similar to those produced by drought stress.

Blueberries should not be grown on sites with soils that are shallow, have a fine or clay texture, are poorly drained, or are at risk of flooding. Even if blueberries could tolerate these conditions, the sites are frequently muddy and cultivating, spraying, and harvesting may be difficult under these conditions.

Ideally, plantings should be located on sites that are gently sloping with medium-to coarse-textured, moderately well drained soils that minimize problems with excess water. Land slopes of 2 to 3 percent provide good surface water and air drainage to help prevent frost drainage. Soil erosion is a potential hazard on slopes over 3 percent. Terraces, water diversion, and grassed waterways may be needed to manage surface water and reduce erosion on steep slopes.

The need for irrigation depends on several factors, including the frequency and duration of droughty periods during critical plant growth stages, crop rooting, and drought tolerance characteristics, and soil water-holding characteristics.

For high-value crops, irrigation is beneficial even in humid climates. For example, in the Northeast, the average number of days between significant rainfall is 5. In one out of every two years, a 10- to 15-day period without rainfall is likely to occur. As a result, one application of irrigation water could provide significant yield benefits to blueberries in at least half of the production years.

Blueberries have shallow root systems that can't use water stored deep in the soil. As a result, blueberries grow best in soils that have a high water-holding capacity. In general, sandy soils will hold the least amount of water. These soils must be irrigated more frequently and with less water per application than soils with a high percentage of silt and clay.

Sprinkler, surface (flood), trickle (drip), microjet, and below-surface (sub-surface) irrigation are the five most commonly used methods of applying irrigation water. In New Jersey, solid-set sprinkler and drip systems are the most common types of irrigation systems installed.

Physical features play an important role in identifying irrigation options. For example, if an adequate water supply is not available at a reasonable cost, irrigation may be impractical, limited in its use, or confined to drip systems. Slopes greater than 10% may prevent the use of some sprinkler systems.

Drip irrigation is usually the method of choice among growers where late spring frosts are uncommon. The system uses less water than overhead systems, the foliage is not wetted, field operations are not interrupted, and nutrients and acidifying amendments can be applied through the system.

Sprinkler irrigation systems with tall risers are used in frost-prone areas. Blueberries flower early in the spring, often prior to the last frost. Unlike strawberry flowers, which open toward the sky, blueberry flowers tend to protect delicate internal reproductive organs from damage. The urn-shaped flowers hang upside down, so the flowers are less prone to frost damage. Still, frost protection is warranted on sites with frequent spring freezes.

Irrigation efficiency is an important factor to be considered. With sprinklers, for example, not all of the water sprayed into the air reaches the ground. Up to 15% is lost directly to evaporation; the actual amount will vary with droplet size, temperature, humidity, and wind speed. Thus, if 1 inch of water is needed to replenish soil moisture for the crop, and the sprinklers are rated and spaced to apply 1 inch per hour, more than one hour would actually be needed to apply 1 inch of water to the soil.

Drip systems are more efficient because they are not affected as greatly by evaporation. Under most on-farm circumstances, drip systems are rated at 90% efficient and sprinkler systems around 75% efficient. Non-uniform application and water losses in the distribution line may also affect efficiency.

Sprinkler and drip systems are the most widely used irrigation methods for blueberries. Components of the systems include: a pumping unit, control head, mainline and submain pipes, and laterals. The irrigation system is used for: watering the plants, frost protection, and to "cool" the plants should the temperature become too high.

Cultivated highbush blueberry bushes generally reach full production within 6 to 10 years after planting; however, a partial crop may be harvested within 3 or 4 years. The harvest season of cultivated blueberries depends on a number of factors. The most important are the variety and the climate of a particular production area. Harvest season typically begins in New Jersey in mid June, about June 10th; peaks from July 1 through August 15, and ends around August 30.

Yields on a typical blueberry site will run from the second to the sixth year, respectively, 50; 200; 2,000; 4,000; and 6,000 pints per acre (40 to 4,500 pounds per acre). A mature plant will bear an average of 6 to 8 pints (4.5 to 6 pounds), but with proper soil management and pruning, it may produce 20 pints or more per year. Variations in yield are due largely to winter damage to buds and canes as a result of extreme winter temperatures and to spring frosts during bloom. Blueberry plants can be expected to be economically productive for up to 30 years of age, with full production being attained in the ninth year after site preparation.

Blueberries can be marketed a number of different ways. Most highbush blueberries produced in North America are sold to retailers, food manufacturers, or institutions. Blueberries can be marketed directly to consumers through Pick-Your-Own (PYO), roadside, or on-farm sales.

The New Jersey office of the USDA/NASS is the primary source of data relative to blueberry production and price. However, interviews with a number of growers reveals that the data distributed by the NASS may not be directly applicable to many of the growing operations in the state. For example, the NASS indicates that there were about 8,087 acres of blueberries throughout New Jersey in Tax Year 1997. This data is derived from information submitted in support of New Jersey Farmland Assessment and includes non-commercial acreage as well as commercial acreage of berries. Interviews with growers indicate that there are only about 5,500 acres of commercially grown berries, predominately located in Atlantic and Burlington Counties.

SOURCES OF DATA USED FOR VALUATION PROCESS

A. New Jersey Agricultural Statistical Service (www.usda.gov.nass.gov/nj/)
   a. Blueberry Statistics
   b. Cranberry Statistics
   c. County Estimates
   d. Nursery Industry Survey Report
   e. Principal Vegetables Annual Survey

B. United States Department of Agriculture, National Agricultural Statistical Service (USDA/NASS) (www.usda.gov.nass)
   a. General Agricultural Statistics
   b. Census of Agriculture
   c. Specialty Agriculture Statistics

C. State of New Jersey
   a. State Agricultural Development Committee (SADC)
      i. Information on conservation easement purchases
      ii. Listing of transfers of restricted farm property by county
      iii. Prime and important farmland soils
   b. State of New Jersey (www.state.nj.us)
      i. Economic Data
      ii. Demographic Data
   c. New Jersey Communities (www.state.nj.us/localgov.htm)
      i. Economic Data
      ii. Demographic Data
   d. State of New Jersey, Aerial Photographs (http://njgeodata.state.nj.us)
   e. Cook College, Rutgers University (www.cook.rutgers.edu)

D. Pinelands Development Credit Bank
   a. Sales Activity of PDC's
   b. State Activity in Purchase and Sale of, and Recording of PDC Transfers

E. Pinelands Commission
   a. Demographic Data for Pinelands Communities
   b. Leads on Real Property (Land Only) Sales in Pinelands (Not available until after 1/1/2002)
   c. Mapping Services in Pinelands

F. New Jersey, United States Department of Agriculture, Farm Service Agency ("USDA/FSA") County Offices
   a. Aerial Photographs
   b. Acreage Calculations
      i. Tillage
      ii. Permanent Plantings
      iii. Irrigated Tillage
      iv. Pasture
      v. Woods/Waste, Etc.

G. New Jersey, United States Department of Agriculture, Natural Resources Conservation Service ("USDA/NRCS") County Offices
    a. Soil Surveys
        i. Bound Volumes in most counties
        ii. Available in digitized form for some counties, see www.nj.nrcs.usda.go for information (Must have ArcView to access digitized data)
H. New Jersey County Offices (Land Planning, CADB, Tax Offices)
    a. Acreage Calculations
        i. Tillage
        ii. Permanent Plantings
        iii. Irrigated Tillage
        iv. Pasture
        v. Woods/Waste, Etc.
    b. Assessment Data
        i. Full Value
        ii. Agricultural Use Values/Calculations
    c. Land Use and Planning
I. American Society of Farm Managers and Rural Appraisers (ASFMRA)
    a. Rural Appraisal Education
    b. Rural Valuation Publications
    c. Specialty Rural Valuation Seminars
        i. Valuation of Conservation Easements
        ii. Valuation of Permanent Plantings
        iii. Valuation of Fractional Interests
        iv. Sales Comparison Seminar
        v. Cost Seminar
        vi. Data Analysis Seminar
J. United States Department of Justice (www.usdoj.gov)
    a. Uniform Standards for Federal Land Acquisitions (www.usdoj.gov/enrd/land-ack/)
K. The Appraisal Foundation (www.appraisalfoundation.org)
    a. Uniform Standards of Professional Appraisal Practice
L. First American Real Estate Solutions, 5601 East LaPalma Avenue, Anaheim, CA (1-800-345-7334)
    a. New Jersey Sale Data Sorted by County, Use, Zone, Etc.
    b. Provides Sale Leads Only
M. First Pioneer Farm Credit, ACA
    a. The Massachusetts Cranberry Cost of Production Summary
    b. Agricultural and Pinelands Area Sale Data
N. Cape Cod Cranberry Growers Association, Wareham, MA
O. Cranberry Marketing Committee, Wareham, MA (Statistical data relative to cranberry production in the U.S.)

P. Publications
   a. The Appraisal of Real Estate, Twelfth Edition, Appraisal Institute
   b. The Appraisal of Rural Property, Second Edition, American Society of Farm Managers and Rural Appraisers and the Appraisal Institute
   c. Rural Appraisal Manual, 7th Edition, American Society of Farm Managers and Rural Appraisers
   d. The Impact of Regulations: The Case of the New Jersey Pinelands Comprehensive Management Plan, Valuation 2000, Papers and Proceedings, by Donn A. Derr, Margaret F. Brennan, Pritam S. Dhillon, and Mark J. Reggimenti, July 2000
   e. A Comparative Analysis of the Economic Characteristics of Grain, Tree Fruit, and Vegetable Farms Located Inside and Outside of the New Jersey Pinelands Comprehensive Management Plan Area, 1984, Department of Agricultural Economics and Marketing, New Jersey Agricultural Experiment Station, Cook College, Rutgers, New Brunswick, NJ, Karen B. Rose & Donn A Derr, June 1986, P-02520-1-86
   f. Influence of Appraiser Subjectivity on Rural land Appraisers, Journal of The American Society of Farm Managers and Rural Appraisers, Volume 61, No. 1, 1997, pp. 16-22
   g. Cranberry Production, an Information Guide, University of Massachusetts, United States Department of Agriculture and Massachusetts Counties Cooperating, 1993, The Plymouth County Conservation District
   h. Cranberry Statistics, Presented by New Jersey Agricultural Statistics Service, May 2001
   i. Using the Income Approach for Specialized Agricultural Properties, Journal of The American Society of Farm Managers and Rural Appraisers, Volume 49, Number 1, April 1985, pp. 38-46
   j. Northeast Regional Agricultural Engineering Service, Ithaca, New York
      i. Bramble Production Guide
      ii. Highbush Blueberry Production Guide
      iii. Mid-Atlantic Orchard Monitoring Guide

Addenda

Owners Property Inspection Report

1. _____ ( ) -_____
Name of Owner or Owner's Representative Telephone Number

_____
Address

_____
Town/City State Zip Code

2. Please Check Appropriate Line:

_____ I wish to accompany the appraiser on an inspection of my property
_____ I wish to have my representative accompany the appraiser on an inspection of the property (please complete item 3).
_____ I do not wish to accompany the appraiser on an inspection of my property

3. _____ ( ) -_____
Name of Authorized Representative Telephone Number

_____
Address

_____
Town/City State Zip Code

4. The following individuals and/or entities occupy the premises in accordance with an agreement as indicated (lease, life estate, etc.)

a. _____ b. _____
Name of Individual/Entity Name of Individual/Entity

_____ _____
Occupied Premises Occupied Premises

_____ _____
Type of Agreement Type of Agreement

5. I certify that I have given the above referenced tenants or occupants notice of the appraiser's inspection of the property.

_____
Name

6. I hereby authorize the appraiser to enter and inspect the property, after reasonable notice, for the purpose of preparing an appraisal report.

_____ _____
Owner's Signature Date

Thank You for your Cooperation
Please return this form in the envelope provided.

SUPPLEMENTAL FRUIT REPORT
(TO BE USED FOR ORCHARD PLANTINGS)

Owner of Subject Property/Sale: _____

YEAR	PRODUCTION			
	APPLES (bu)	PEACHES (bu)	PEARS (bu)	OTHER _____
2001				
2000				
1999				
1998				
1997				
1996				

(A 3 to 5 year production history is recommended)

VARIETY	NO. ACRES	AGE OR YR PLANTED	SPACING	CONDITION

Comment on varieties; spacing; adequacy of pollination; air drainage, frost susceptibility/protection; wind, hail, or other hazards; tree diseases or damage; terminal growth; source and adequacy of spray water; marketing; and storage facilities.

_____ DATE

_____ APPRAISER

SUPPLEMENTAL FRUIT REPORT
(TO BE USED FOR BLUEBERRY PLANTINGS)

Owner of Subject Property/Sale: _____

YEAR	PRODUCTION (Lbs/Acre)			
	WEYMOUTH	DUKE	BLUE CROP	OTHER _____
2001				
2000				
1999				
1998				
1997				
1996				
1995				
1994				
1993				
1992				

(A 5 to 10 year production history is recommended)

VARIETY	NO. ACRES	AGE OR YR PLANTED	SPACING	CONDITION

Comment on varieties; spacing; adequacy of pollination; air drainage, frost susceptibility/protection; wind, hail, or other hazards; diseases or damage; terminal growth; source and adequacy of water; irrigation system (drip or solid set); marketing; and storage facilities.

_____ DATE

_____ APPRAISER

SUPPLEMENTAL VINEYARD REPORT
(TO BE USED IN VINEYARD VALUATION)

Owner of Subject Property/Sale: _____

VARIETY	SPACING	ACRES	AGE OR YEAR PLANTED	ANNUAL YIELD (TONS/ACRE)						
				1996	1997	1998	1999	2000	2001	AVERAGE YIELD

A three to five year production history is recommended.

COMMENT ON: Varieties; Spacing; Air Drainage; Frost; Wind; Hail; Hazards; Vineyard Diseases or Damage; Vine Vigor; Marketing.

_____ DATE

_____ APPRAISER

SUPPLEMENTAL CRANBERRY REPORT
(TO BE USED FOR CRANBERRY PLANTINGS)

Owner of Subject Property/Sale: _____

YEAR	PRODUCTION (Barrels per Acre)			
	VARIETY _____	VARIETY _____	VARIETY _____	VARIETY _____
2001				
2000				
1999				
1998				
1997				
1996				

(A 5 to 7 year production history is recommended)

VARIETY	NO. ACRES	AGE OR YR PLANTED	CONDITION

Comment on varieties; spacing; frost susceptibility/protection; wind, hail, or other hazards; diseases or damage; growth; source and adequacy of water and sand (amount of excess, or support/buffer acreage); vine vitality and vigor; marketing; and support facilities. Attach a copy of Ocean Spray Exhibit A or equivalent.

_____ DATE

_____ APPRAISER

DIRECT SALES COMPARISON GRID

Sale No.	1	2	3	4	5
Date	6-months	Current	1-year	6-months	1-year
Sale Price	$325,000	$390,000	$400,000	$460,000	$520,000
Size (Acres)	350 ac.	450 ac.	425 ac.	435 ac.	500 a.
Financing	Cash equiv.	Cash equiv.	Cash equiv.	Cash equiv.	Cash equiv.
$/Acre	$929	$867	$941	$1,057	$1,040
Adjustments					
Land	+79	+5	+87	+60	0
Buildings	-61	+76	+60	0	-18
Adj. $/Acre	$947	$949	$1,088	$1,117	$1,022
Market Conditions	6-months	Current	1-year	6-months	1-year
Time Adj.	-47	0	-107	-51	-97
Adj. $/Acre	$900	$949	$981	$1,066	$925
Location	Avg.	Avg.	Good	Good	Avg.
Location Adj.	+85	+85	0	0	+85
Adj. $/Acre	$985	$1,034	$981	$1,066	$1,010
Size (Acres)	350 ac.	450 ac.	425 ac.	435 ac.	500 ac.
Size Adj.	0	0	0	0	0
Adj. $/Acre	$985	$1,034	$981	$1,066	$1,010
Other Characteristics					
Characteristic Adj.					
Adj. $/Acre	$985	$1,034	$981	$1,066	$1,010
Final Ind. Value/Acre	$985	$1,034	$981	$1,066	$1,010
Subject Acres	370	370	370	370	370
Indicated Value	$364,450	$382,580	$362,970	$394,420	$373,700