

SUSTAINABILITY ASSESSMENT IN AGRICULTURE:  
ANNOTATED BIBLIOGRAPHY AND RESOURCE LIST OF METHODS

JOHN VICKERY  
and  
LUANNE LOHR

John Vickery is at the Institute for Agriculture and Trade Policy, 2105 First Avenue South, Minneapolis, MN 55404.

Luanne Lohr is an Assistant Professor, Department of Agricultural and Applied Economics, The University of Georgia, Athens, Ga, 30602.

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Dept. of Agricultural & Applied Economics  
College of Agricultural & Environmental Sciences  
University of Georgia

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JOHN VICKERY

Institute for Agriculture and Trade Policy  
2105 First Avenue South  
Minneapolis, MN 55404  
jvickery@iatp.org

LUANNE LOHR

Department of Agricultural and Applied Economics  
University of Georgia  
Athens, GA 30602-7509  
llohr@agecon.uga.edu

### ABSTRACT---

Sustainability assessment is fundamental to improving the long-term viability of agricultural systems. A variety of assessment tools have been developed for the practitioner to evaluate sustainability at multiple levels, from field to farm. This report is a compilation of annotated references on assessment methods from published and unpublished sources. Each section contains a methodological description, a list of published sources, and a list of relevant programs and contacts. While not exhaustive, the report presents a range of tools and applications that are currently in use or are in testing for future use.

### -----KEY WORDS-----

farm management, environmental audit, farm planning, farm assessment

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**Sustainability Assessment in Agriculture:**

## **Annotated Bibliography and Resource List of Methods**

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## 1. Introduction

Sustainability assessment is fundamental to improving the long-term viability of agricultural systems. A variety of assessment tools have been developed for the practitioner to evaluate sustainability at multiple levels, from field to farm. This report is a compilation of annotated references on assessment methods from published and unpublished sources. Each section contains a methodological description, a list of published sources, and a list of relevant programs and contacts. While not exhaustive, the report presents a range of tools and applications that are currently in use or are in testing for future use. Inclusion in this report does not imply recommendation of particular methods, nor does exclusion suggest rejection. Any additions or corrections should be reported to the corresponding author.

Assessment methods have been developed to support improvements in agricultural production, marketing, education and research. It is difficult to reward improvement without being able to establish current status of sustainability and measure changes. Some aspects of sustainability are easily quantified, while other changes are more subtle or are qualitative and hence, more difficult to observe. The purposes for which a method is developed determine the approach used and the extent of coverage. Goals include:

- education and motivation of farmers and farm managers
- determination of eligibility for cost-sharing programs and other forms of assistance
  - certification of differentiated products for marketing
  - training for consultants and extensionists
- public recognition of environmental stewardship by farmers or agricultural groups
  - outreach and education for consumers
- identification or prioritization of research and extension needs
  - characterization of agricultural systems for research
  - evaluation of research and extension programs
- environmental impact assessment for regulatory compliance.

The scope of the assessment method depends in part on the purposes. Among tools designed to be used by farmers and consultants to improve sustainability of the farm, most can be classified as:

- crop-specific assessment
  - field-level assessment
- farm-level assessment or whole-farm planning
  - environmental impact assessment.

The first three methods are for evaluating production or management practices for productivity and environmental stewardship. Environmental impact assessment (EIA) measures the potential or realized adverse impacts of chemicals or practices on the environment. Some crop-specific and field-level programs incorporate EIA (*e.g.*, pesticide ratings) as a required or optional certification criterion. Both qualitative and quantitative evaluation systems are used in assessment of production systems at all levels.

Few crop-specific assessment programs are in place, but many are now in planning, development and initial implementation stages. Crop-specific tools emphasize productivity, often with individual practices rather than systems being evaluated. The format of the evaluation may ask a farmer to indicate whether a recommended practice is used, with points awarded if adopted. Most crop-specific assessment tools are associated with marketing programs.

Field-level assessments are more generic, setting the same criteria for all the crops produced. At this level, criteria for sustainability are more rigid, such as designating permitted and prohibited chemicals or practices along with certain recommended practices found in crop-specific assessments. One purpose for these assessments is often certification of production practices for marketing purposes.

Farm-level assessments, being the most general, incorporate components into a system assessment. Some farm-level assessments include crop-specific evaluation criteria for pest management and crop nutrient management. Some contain evaluation components specific to livestock production—the equivalents of a crop-specific assessments. Some are designed for growers who raise one main crop, but manage an entire system. There is greater flexibility in the criteria for farm-level assessments, because system evaluation is goal-oriented. Rather than recommending or requiring a specific practice or an input, these criteria set goals that the farmer may meet in a variety of ways. Farm-level tools treat environmental protection and yield as equally important in system design. Comparatively, crop-specific or field-level assessments focus on practices that satisfy yield goals with less environmental damage.

Specific assessment methods have been developed for pesticides due to the extent of use and the potential for severe adverse impacts on human health and the environment. Ratings of potential damage are usually based on such indicators as toxicity factors, use levels, persistence, soil sorption, proximity to water, and means of application. Ratings for factors may be combined to give an overall assessment or may be presented in several categories of interest such as consumer or farm worker effects or for distinct environmental components, such as soil or groundwater. EIA may be a stand-alone evaluation tool, or be incorporated into farm-level assessments.

Certification and labeling programs enable public recognition and marketing opportunities through product differentiation. These programs formalize the results of crop-specific, field-level and farm-level assessments. Instead of emphasizing farmer information, certification and labeling have been devised to provide information and guarantees to the public about production methods for commodities. These programs usually involve monitoring and may provide for enforcement against violators.

Expert systems and computer assisted approaches are primarily used for planning purposes. By accessing computers, these systems permit multiple scenarios to be evaluated rapidly. Farmers may assess their current situation and compare possible improvements for a variety of alternative plans. Expert systems incorporate specialists' recommendations and may offer assistance on specific management questions the farmer has regarding sustainability.

Sustainability assessment tools have been developed for several other sectors including forests, golf courses, residential, institutional (schools) and corporate lands. Forestry assessment tools are mostly related to marketing through certification and labeling, and several examples are included.

This resource listing focuses on tools or methods designed to be used by practitioners for farm evaluation, planning and marketing. Omitted are approaches where group evaluation rather than individual self-improvement is the objective, such as data collection surveys. Where available, a description of the format for the method is given. All programs are for the United States or its regions or states unless otherwise specified. Readers are referred to the program contacts listed for further information about specific assessment and marketing tools.

## 2. Crop-specific Assessment

### 2.1 Crop-specific—Qualitative

Qualitative self-assessment tools are for informational purposes, to suggest where a farmer is and suggest directions for change, rather than to measure the degree of sustainability attained. Qualitative crop-specific assessment instruments are usually designed as questionnaires for farmers to use in organizing information about their systems. Two examples have been developed for cotton growers in response to the resurgence of cotton production in the Southeastern U.S. Qualitative assessments help the farmer to evaluate production system sustainability as it evolves from traditional row crops. Cotton Production Practices in Georgia: a Self-test for Growers was designed to be used by farmers in Georgia for choosing among practices that might fit a sustainable production system for cotton. The Cotton Cares Program is intended for use only by cotton growers, but is not limited to one state.

#### Cotton Production Practices in Georgia: a Self-test for Growers

*Contact:* John Vickery, Institute for Agriculture and Trade Policy, 2105 First Avenue South, Minneapolis, MN 55404, (612) 870-0453; FAX (612) 870-4846; [jvickery@uga.cc.uga.edu](mailto:jvickery@uga.cc.uga.edu)

*Purpose:* education and motivation

*Format:* Multiple choice format, respondent marks one or more answers. Plus (+), zero (0), minus (-) qualitative rating system for responses, indicating recommended, neutral or unimportant, and undesirable practices. Annotated answers and recommendations for each section. Sections on management of weeds, insects, diseases, water, soil and nutrients.

*Publications:* Vickery, J. C. 1996. *Evaluating Cotton Production Practices in Georgia: A Grower Self-Test with Multiple Applications*. M.S. Thesis, University of Georgia, Athens, GA. 227 pp.

#### Cotton Cares Program

*Contact:* Paul Dugger, Manager, Special Technical Projects, National Cotton Council, Box 12285, Memphis, TN 38182-0285, (901) 274-9030; FAX (901) 725-0510

*Purpose:* education and motivation, outreach

*Format:* Checklist format for recommended production and farm management techniques.

*Publications:* National Cotton Council. 1996. *Cotton Cares: A Natural Commitment to the Environment*. Program description and evaluation checklist. Memphis, TN. 21 pp.

## 2.2 Crop-specific—Quantitative

Quantitative crop-specific tools use point systems to measure the progress toward sustainability goals in production practices. Cumulative points may be compared with a minimum ‘passing’ score or with scores scaled to verbal descriptions of progress. Scores may be calculated by management area (nutrients, pest control, *etc.*) or may be summed for a single statistic of overall performance. Perhaps the most difficult design aspect of these quantitative tools is the selection and scoring of criteria for sustainability. Of necessity, criteria and scoring must be updated to reflect new research findings in sustainable agriculture. The Farmer Sustainability Index was constructed in a developing country context to provide farmers a means of being recognized for sustainability that based on performance. Integrated Pest Management (IPM) tools are used for marketing certification as well as farmer education, and adoption of state level certifying programs is spreading in the United States, particularly in the Northeast.

### Farmer Sustainability Index - Malaysia

*Contact:* see *Publications*

*Purpose:* education and motivation

*Format:* Interviewer scores 33 assessment criteria for highland cabbage production in Malaysia to develop a summary statistic of sustainability. Positive, zero-valued, and negative points assigned to recommended, neutral/intermediate, and undesirable practices. Designed for use by extensionists. Not in current use, nor development of similar tool for other crops in Malaysia (D.C. Taylor, personal communication, July 1996).

*Publications:* Taylor, D.C., Z.A. Mohamed, M.N. Shamsuden, M.G. Mohayidin, and D.F.C. Chiew. 1993. Creating a farmer sustainability index: a Malaysian case study. *American Journal of Alternative Agriculture* 8(4):175–184.

### IPM Cotton - Alabama

*Contact:* see *Publications*

*Purpose:* education and motivation

*Format:* Respondent marks 16 criteria. Scored for a maximum of 100 points, compared with desired practices. Not developed nor widely implemented after 1981 introduction.

*Publications:* Boutwell, J.L., and R.H. Smith. 1981. A new concept in evaluating integrated pest management programs. *Bulletin of the Entomological Society of America* 27(2):117–118.

### IPM Cotton - Texas

*Contact:* Shashank S. Nilakhe, Dir. for Agri-Systems, Texas Dept.of Agriculture, Austin, TX.

*Purpose:* market certification

*Format:* Certifier assigns points for 24 questions in 14 categories of management practices. Maximum points from 5 to 20 per question, based on importance of practice to pest control. Maximum total points 285,

with a minimum of 200 for certification. Not officially adopted, not in current use, has not been developed further since introduction in 1994.

*Publications:* Nilakhe, S.S. 1994. A pilot project on Integrated Pest Management certification in cotton. *1994 Proceedings of the Beltwide Cotton Conference*, January 5-8, San Diego, CA. National Cotton Council, Memphis, TN, pp. 973-974.

### IPM Potatoes

*Contact:* 1. Paul Zuleger, Exec. Dir., Wisconsin Potato & Vegetable Growers Assoc., Antigo, WS, (715)623-7683; wpvga@newnorth.net

2. Polly Hoppin, World Wildlife Fund, 1250 24th St. NW, Washington DC 20037, (202) 778-9667; polly.hoppin@wwfus.org

3. Charles Benbrook, Benbrook Consulting Services, 409 First Street SE, Washington DC 20003, (202) 546-5089; FAX-5028; benbrook@hillnet.com; <http://www.pmac.net>

*Purpose:* education and motivation, market certification

*Format:* Integrates three components: scoring for practices used (“preventative practice points”), a measure of pesticide use (Dose Adjusted Acre Treatments (DAAT)) and a measure of pest infestation, to be used in determining appropriateness of pesticide use for particular and unusual pest and weather conditions. Being developed in cooperation with the World Wildlife Fund. Assessment tool in preliminary development stage.

*Publications:* Benbrook, C.M., and E. Groth III. 1997. Indicators of the sustainability and impacts of pest management systems [presentation]. AAAS 1997 Annual Meeting, Seattle, WA. February 16, 1996. [Online at <http://www.pmac.net/aaas.htm>]

Benbrook, C., E. Groth, J. Halloran, M. Hansen, and S. Marquardt. 1996. *Pest Management at the Crossroads*. Consumers Union, Yonkers, NY. [Description online at <http://www.pmac.net>]

### IPM Tomatoes - Alabama

*Contact:* G. M. Zehnder; (334) 844-6388; gzehnder@acesag.auburn.edu

*Purpose:* education and motivation, market certification

*Format:* Respondent answers questions scored with a two-factor point system applied according to the criteria (similar to the Massachusetts IPM Guidelines). Criteria assigned weight of 1 (low importance), 2, 3, or 4 (high importance). Weight is multiplied by frequency factor of 0 (never), 1 (sometimes), 3 (often), or 4 (always).

*Publications:* Bauske, E.M., G.M. Zehnder, E.J. Sikora, and J. Kemble. [In Review]. IPM Use by Southeastern Tomato Growers. Alabama Cooperative Extension System, Extension Hall, Auburn University, Auburn, AL 36849



IPM Fruits and Vegetables; Partners with Nature Program - Massachusetts

- Contact:* 1. Craig Hollingsworth, IPM Specialist, Dept. of Entomology, Box 3021, University of Massachusetts, Amherst, MA 01003-0210, (413) 545-1055; FAX (413) 545-5858; chollingsworth@umext.umass.edu
2. Iliana Rivas, Environmental Consultant, Executive Office of Environmental Affairs, Dept. of Food and Agriculture, 100 Cambridge St., Boston, MA 02202, (617) 727-3020 ext. 129
3. Paul Fischer, USDA Farm Services Agency, 319 Littleton Rd., Suite 203, Westford, MA 01886, (508) 692-5163

*Purpose:* market certification, education and motivation, public recognition, eligibility for assistance

*Format:* IPM Guidelines available for apple, cole crops, cranberry, pepper, potato, pumpkin and winter squash, strawberry, sweet corn and tomato. Certifier scores statements for 30 to 60 criteria, depending on crop. Point value for each criterion varies from 5 to 25 in multiples of five. Maximum total points vary from 305 to 490 by crop. All criteria are scored for recommended or desirable practices—there are no negative points for undesirable practices. For certification, a minimum of 70% of the total possible points must be achieved. Bonus points are awarded for exemplary, experimental, or advanced practices. Criteria are also used for public recognition under the “Partners with Nature” program, and as a basis for determining eligibility for cost sharing under the SP-51 Integrated Crop Management program administered by USDA Consolidated Farm Services Agency. Expected to be used for eligibility for cost sharing under the Environmental Quality Improvement program of the 1996 Farm Bill.

*Publications:* Hollingsworth, C.S. 1994. Integrated Pest Management certification: a sign by the road. *American Entomologist* (Summer):74–75.

Hollingsworth, C.S. 1995. Extending the concepts of IFP to other crops: an IPM certification program in Massachusetts, USA. Paper presented at the IOBC/ISHS Conference in Cedzyna, Poland in September, 1995. 5 pp.

Hollingsworth, C.S., and W.M. Coli. 1992. The Integrated Pest Management education and certification project, 1992 update. *Fruit Notes* (Fall):1–2.

Hollingsworth, C.S., Coli, W.M., and R.V. Hazzard, eds. 1996? (undated). *Integrated Pest Management, Massachusetts Guidelines: Commodity Specific Definitions, SP-136*. Univ. Massachusetts Extension Integrated Pest Management Program. 41 pp.

Hollingsworth, C.S., M.J. Paschall, N.L. Cohen, and W.M. Coli. 1993. Support in New England for certification and labeling of produce grown using integrated pest management. *American Journal of Alternative Agriculture* 8(2):78–84.

IPM Vegetables; Elements of IPM - New York

*Contact:* 1. Curtis Petzoldt, Senior Extension Assoc., Vegetable Integrated Pest Management, Cornell University, New York State Agric. Expt. Station, IPM Program Office, Geneva, NY 14456-0462, (315) 787-2206; FAX (315) 787-2360; curt\_petzoldt@cornell.edu

2. William Pool, Comstock Michigan, (716) 328-2550; FAX (716) 239-2089; pool@sevtech.com

3. Tom Facer, Wegmans Food Market, Pittsford, NY

*Purpose:* market certification, outreach and education, education and motivation

*Format:* Points assigned for practices used (similar to Massachusetts IPM Guidelines) with proprietary point system. Minimum of 80% of the maximum total points for certification. One criterion requires use of environmental impact assessment ratings for pesticide selection decisions. Cooperative venture among Cornell University, New York vegetable growers, produce packer Comstock Michigan, Inc. and supermarket chain Wegmans Food Market. In 1995 program began with sweet corn; one grower, one store. In 1996, Elements of IPM set for 7 vegetable crops; four sweet corn growers, numerous stores; introduction of canned vegetables with Wegman label and New York State IPM logo under nonexclusive license with the Cornell Research Foundation.

*Publications:* Online at [http://www.nysaes.cornell.edu:80/ipmnet/ny/whats\\_new/](http://www.nysaes.cornell.edu:80/ipmnet/ny/whats_new/). Links to the *Elements of IPM* (5/96 draft), a related article, *An IPM label on supermarket vegetables: a first for the nation*, and related topics.

Online at <http://www.nysaes.cornell.edu/ipmnet/archive/ny.wegmans.html>. *New York IPM-Labeled Vegetables: Growers, packer and retailer partner to promote vegetables grown using Integrated Pest Management* (Nov. 21, 1996).

#### National IPM Definition

*Contact:* 1. Paul Zuleger, Exec. Dir., Wisconsin Potato & Vegetable Growers Assoc., Antigo, WS, (715) 623-7683

2. National Potato Council (NPC) and the National Potato Research and Education Foundation, 5690 DTC Blvd., Suite 230E, Englewood, CO 80111-3200, (303) 773-9295; FAX (303)773-9296

*Purpose:* market certification

*Format:* Dichotomous response checklist, “preventative practice points” format (similar to Massachusetts IPM Guidelines), but more detailed and longer. Under development by public and private sector cooperators, sponsored by US EPA Pesticide Environmental Stewardship Program. National Potato Council board scheduled to review the standards in June 1997. Available to the public following approval.

*Publications:* see *Contact*

### 3. Field-level Assessment (quantitative)

Field-level assessment instruments apply the same evaluation criteria to all crops or groups of similar crops.

As with crop-specific tools, emphasis is on assessing practices. In the examples given here, the farmer's contribution to environmental protection is considered by addressing pesticide safety and resource protection.

#### 3.1 Crop Oriented

Crop oriented assessments compare actual practices and inputs to those accepted, restricted or prohibited by the program. Integrated Fruit Production (IFP) began as a integrated plant protection system in Europe in the 1950s, but experienced major growth in the late 1980s. The proportion of apple and pear acreage in western Europe that is managed under an IFP program is approaching 50%, ranging from less than 1% of acreage in Spain to 82% in Austria, for a total of 790,000 acres in Europe. In 1995, there were 31 participating regional or national IFP or Quality Assurance (a similar program) organizations in twelve countries. Guidelines used may vary by country or organization and are not necessarily consistent with the International Organization for

Biological and Integrated Control of Noxious Animals and Plants (IOBC), who developed Integrated Production Guidelines and Certification for pesticide use for Europe. In the United States, IFP-influenced programs have been introduced in the Pacific Northwest (Hood River District Integrated Fruit Production Program and Responsible Choice® Program by Stemilt Growers, Inc.) and the Northeast (CORE Values Northeast Program). While price premiums are sometimes available for IFP commodities, the spread of the program in Europe has been attributed to government regulations on pesticide use, subsidies and tax credits for desirable practices and government-sponsored marketing programs. Appropriate chemical use is a defining characteristics of these programs.

#### Integrated Production Guidelines and Certification - Europe

*Contact:* International Organization for Biological Control (IOBC), General Secretariat,  
INRA Station de Recherches de Zoologie et d'Apidologie, Domaine Saint-Paul Cantarel  
Route de Marseille - B.P. 9184143 Montfavet, France

*Purpose:* market certification, regulatory compliance, eligibility for assistance, public recognition

*Format:* Guidelines describe acceptable pesticide use on pome fruits. A "points for practices" system (like the Massachusetts IPM Guidelines), is used by certifying organizations to score applicants for certification and by the IOBC for evaluating certifying organizations' guidelines for IOBC endorsement. Failure to seek or obtain IOBC endorsement carries no penalty. The second edition IOBC guidelines, published in 1994, define IFP as "... as the economical production of high quality fruit, giving priority to ecologically safer methods, minimizing the undesirable side effects and use of agrochemicals, to enhance the safeguards to the environment and human health." Soil sterilants are not permitted. Locally or nationally available pesticides are classified in three categories - permitted ("green list"), permitted with restrictions ("yellow list"), not permitted ("red list") - according to toxicity to humans, key natural enemies and other natural organisms, pollution of ground and surface water, ability to stimulate pests, selectivity, persistence, completeness of information, and necessity of use. Proscribed materials include pyrethroid and organochlorine insecticides and acaricides, nonnaturally occurring plant growth regulators, and toxic, water polluting, or very persistent herbicides.

*Publications:* Cross, J.V., and E. Dickler, eds. 1994. Guidelines for Integrated Production of pome fruits in Europe: IOBC Technical Guideline III. *IOBC/WPRS Bulletin* 17(9):1-8.

International Organization for Biological and Integrated Control of Noxious Animals and Plants, Montfavet, France. ISBN92-9067-067-3 [in English, French, German, Italian, Spanish]

Dickler, E. 1992. Current situation of integrated plant protection (IPP) in orchards in IOBC WPRS. *Acta Phytopathologica Et Entomologica Hungarica* 27(1-4): 23-28.

Dickler, E., and S. Schäfermeyer. 1991. General principles, guidelines and standards for integrated production of pome fruit in Europe and procedures for endorsement of national and regional guidelines and standards. *OILB Bulletin* SROP1991/XI/3.

Galli, P. 1992. Present status of guidelines for integrated fruit production and marketing in the Federal Republic of Germany. *Acta Phytopathologica Et Entomologica Hungarica*. 27(1-4): 251-256.

Hollingsworth, C.S. 1995. Integrated Fruit Production (IFP): a status report. *Fruit Notes*. (Fall):14-15.

Muller, W., ed. 1990. Symposium on Integrated Fruit Production, Wädenswil, Switzerland, Sept. 11-15, 1989. International Society for Horticultural Science, Wageningen, The Netherlands. 193 pp. [Series: *Acta horticulturae* nr. 285]

Reed, A.N. 1995. Responsible Choice: a systems approach to growing, packing, and marketing fruit. In J. Hull Jr. and R. Perry. (eds.) *The 125th Annual Report of the Secretary of the State Horticultural Society of Michigan for the Year 1995*. pp. 68-78.

Schenk, A.M.E., A.D. Webster, and S.J. Wertheim, eds. 1993. 2nd International Symposium on Integrated Fruit Production, Veldhoven, Netherlands, August 24-28, 1992. ISHS, International Society for Horticultural Science, Wageningen, Netherlands. p. 377. [Series: *Acta horticulturae* nr. 347]

Schenk, A.M.E., and S.J. Wertheim. 1992. Components and systems research for integrated fruit production. *Netherlands Journal of Agricultural Science* 40(3):257-268.

Waldner, W. 1995. Integrated fruit production is success in Italy. *Good Fruit Grower*. March 15, 1995. [Online at [http://www.goodfruit.com/archive/March15\\_96/special8.html](http://www.goodfruit.com/archive/March15_96/special8.html); originally published in the 1995 International Dwarf Fruit Tree Association Proceedings]

Wildbolz, T. 1994. Integrated plant protection: goals, developments. *Revue Suisse De Zoologie* 101(4): 905-909. [in German]

#### Hood River District Integrated Fruit Production Program

*Contact:* 1. Clark Seavert, Extension Economist, Agric. and Resource Economics Dept., Oregon State Univ., Mid-Columbia Agric. Research and Extension Center, 2990 Experiment Station Drive, Hood River, OR 97031, (541) 386-3343; FAX (541) 386-3684; [seavertc@oes.orst.edu](mailto:seavertc@oes.orst.edu)

2. Franz Niederholzer, Extension Agent, Hood River County, same address as 1 [niederhf@hood.oes.orst.edu](mailto:niederhf@hood.oes.orst.edu)

3. Helmut Riedl, Extension Entomologist, (541) 386-3020; same address as 1

4. Felix Tomlinson, Chairman, Hood River Grower Shipper Association's IFP committee.

*Purpose:* market certification, advisor training, education

*Format:* Guidelines on management of site ecology, soil and tree nutrition, orchard floor treatment, irrigation, tree and fruit quality and post-harvest treatment and storage for apples and pears. Emphasis on integrated plant protection and agrichemical safety. Pesticides approved for the IFP program for use on apples and pears are rated most preferred (1), preferred (2) or permitted (1, 2, or 3). Ratings assigned according to leaching potential, soil sorption, toxicity, efficacy, pre-harvest interval, soil half-life, effect on beneficials and biological disruption. Residue levels at harvest must not exceed EPA tolerances, and minimizing residues is a stated program goal. Preference ratings are reviewed annually. Accreditation through a standardized spray recording system, used by third party to assess knowledge of chemical use and progress toward IFP. Logo to distinguish certified fruit. Details are given online at <http://www.orst.edu/dept/hort/orchardnet/hifp.htm>.

*Publications:* Hood River District IFP Program. [current] *Chemicals in Pear Production*. Online at <http://www.orst.edu/dept/hort/orchardnet/pespray.html>. [Preference ratings for pear pesticides]

Hood River District IFP Program. [current] *Chemicals in Apple Production*. Online at <http://www.orst.edu/dept/hort/orchardnet/apspray.html>. [Preference ratings for apple pesticides]

Niederholzer, F.J.A., C. Seavert, H. Riedl. 1996. Demonstration and implementation of integrated fruit production (IFP) on pears in Northern Oregon: introduction. International Symposium on Pear Growing, Tulca, Chile. *Proceedings of the Oregon Horticultural Society*, forthcoming.

Penrose, L.J., W.G. Thwaite, and C.C. Bower. 1994. Rating index as a basis for decision making on pesticide use reduction and for accreditation of fruit produced under integrated pest management. *Crop Protection* 13(2):146-152.

Seavert, C., F.J.A. Niederholzer and H. Riedl. 1996. Demonstration and implementation of integrated fruit production (IFP) on pears in Northern Oregon: economics. International Symposium on Pear Growing, Tulca, Chile. *Proceedings of the Oregon Horticultural Society*, forthcoming.

Waldner, W. 1996 Why IFP? International symposium on pear growing. *Proceedings of the Oregon Horticultural Society*. 87:47-51.

#### Responsible Choice© Program

*Contact:* Nathan Reed, Director of Research and Development, Stemilt Growers, Inc., Box 2779, Wenatchee, WA 98807, (509) 663-1451; FAX (509) 665-0707; [reed@ncw.net](mailto:reed@ncw.net)

*Purpose:* education and motivation, marketing certification

*Format:* Voluntary use of pesticide environmental impact ratings in choosing pesticides. Pesticide application records are submitted to the fruit packer. Annual EIA ratings (Responsible Choice Points®) are calculated. Participants do not receive price premiums, nor is fruit acceptance based on annual point total, but retailers may be favorably influenced toward purchase by program information. Individual fruits are labeled by program participants.

*Publications:* Stemilt Growers make responsible choice. 1994. *Fruit Grower* 59(April):20-21.

Reed, A.N. 1995. Responsible Choice: a systems approach to growing, packing, and marketing fruit. In J. Hull Jr. and R. Perry (ed.) *The 125th Annual Report of the Secretary of the State Horticultural Society of Michigan for the Year 1995*. pp. 68–78.

### CORE Values Northeast Program

*Contact:* Wendy Gordon, Exec. Dir., Mothers & Others for a Livable Planet, 40 West 20th St., 9th Floor, New York, NY 10011-4211, (212) 242-0010 ext. 307; FAX (212) 242-0545; 1-888-ECOINFO; wgordon@igc.apc.org

*Purpose:* outreach, market certification, education and motivation, public recognition

*Format:* Guidelines for apple production. Certification based on submission of a farm plan, assessment of knowledge by a third party inspector every five years and adherence to the *Apple Grower Guidelines*. Farm plan consists of three parts: 1) maps and narrative description of history, information sources, soil stewardship program, water quality protection plan, and harvest, handling, and storage methods; 2) tabular record of pest problems, control methods, and related issues; and 3) detailed narrative description of information-based decision making including preventive, control, and diagnostic methods or procedures and decision criteria. Classed as a field-level assessment tool because the farm plan must include apple acreage, but the rest of the farm operation is not mandated to comply for certification. A program of the Northeast Stewardship Alliance Project, Communities Organized in Respect for the Environment (CORE).

*Publications:* See *Contact* for more information on all listed.

*About Northeast Stewardship Alliance Growers.* 2 pp.

*CORE Values Statement,* 1 p.

The Northeast Stewardship Alliance CORE Values Northeast, *Apple Grower Guidelines for 1997 Growing Season.* 3 pp.

### 3.2 Environment Oriented

Some field-level assessment tools focus on protecting resources and score practices according to soil conservation, water quality, *etc.* Farm activities are compared to Best Management Practices (BMPs). The tools listed here are applied at the field-level, but have a narrow focus. Such tools may be incorporated in farm-level assessments or be used with crop-specific or field-level assessment tools.

#### BMPs for Wetlands Agriculture

*Contact:* South Florida Water Management District, Regulation Dept., 3301 Gun Club Rd., West Palm Beach, FL 33406-3089

*Purpose:* regulatory compliance

*Format:* Equivalent point values of 2½, 5 and 10 awarded for BMPs to reduce phosphorus leaving the site. Maximum is 80+. Minimum for permit approval is 25 points for any combination of practices.

*Publications:* Whalen, P.J., and B.M. Whalen. 1996. Nonpoint source best management practices program for the Everglades agricultural area. Paper for 1996 American Society of Agricultural Engineers annual meeting, Phoenix, AZ.

#### BMPs for Conservation Tillage

*Contact:* Conservation Technology Information Center, 1220 Potter Drive, Room 170, West Lafayette, IN 47906-1383, (765) 494-9555; FAX (765) 494-5969; [ctic@ctic.purdue.edu](mailto:ctic@ctic.purdue.edu)

*Purpose:* education and motivation, advisor training

*Format:* Guidebook on residue management, with recommendations on pest, nutrient, and crop residue management, soil adaptability and farm economics. Considerations for five regions of the United States based on crops, climate and soils.

*Publications:* CTIC. [undated] *Conservation Tillage: A Checklist for U.S. Farmers*, 36 pp. [Online at <http://kyw.ctic.purdue.edu/BMPs/Checklist/Checklist.html>]

#### BMPs for Surface Water Quality

*Contact:* Gary Honea, Agricultural Engineering, University of Tennessee - Knoxville, PO Box 1071, Knoxville, TN 37901-1071, (423) 974-7237; FAX (423) 974-4514; [ghonea@utk.edu](mailto:ghonea@utk.edu)

*Purpose:* education and motivation

*Format:* Two indices of surface water quality. Management Practice Index (MPI): selected contaminants (sediment, phosphorus, nitrogen, coliform bacteria) measure BMP effectiveness on a 0.00 to 1.00 scale. System Response Index (SRI): ratio of measured contaminant level to maximum theoretical contaminant level. The higher the SRI, the more likely that additional BMPs will improve water quality.

*Publications:* Honea, G. 1996. *Relating Water Quality to Management Practices*. Thesis. 129 pp.  
Abstract available from author, see *Contact*.

BMPs Program, Canada-Ontario Agriculture Green Plan - Canada

*Contact:* Ontario Federation of Agriculture, Attn: Manager, BMP, 40 Eglinton Ave. E., 5th flr., Toronto, Ontario, M4P 3B1 Canada, (416) 485-3333; FAX (416) 485-9027; ofarsch@flexnet.com;  
<http://res.agr.ca/lond/gp/gphompag.html>

*Purpose:* education and motivation

*Format:* Booklets present a range of circumstances and options for response that address particular environmental concerns about management of farm forestry and habitat, field crop production, fish and wildlife habitat, horticultural crops, integrated pest management, irrigation, livestock and poultry waste, no-till cultivation, nutrients, pesticide storage, handling and application, soils, water and water wells. Some booklets include worksheets, some case studies, in addition to recommended management practices.

*Publications:* OFA. [no date] *Farm Forestry and Habitat Management*. 2nd revised printing. OFA, Toronto, Ontario. ISBN 0-7778-1246-0. 40 pp. (45-minute introductory video also available)

OFA. [no date] *Field Crop Production*. OFA, Toronto, Ontario. ISBN 0-7778-1250-9. 133 pp.

OFA. [no date] *Fish and Wildlife Habitat Management*. OFA, Toronto, Ontario. ISBN 0-7778-4906-2. 92 pp.

OFA. [no date] *Horticultural Crops*. 2nd revised printing. OFA, Toronto, Ontario. ISBN 0-7778-1248-7. 77 pp.

OFA. [no date] *Integrated Pest Management*. OFA, Toronto, Ontario. ISBN 0-7778-4495-8. 38 pp.

OFA. [no date] *Irrigation Management*. OFA, Toronto, Ontario. ISBN 0-7778-4497-4. 106 pp.

OFA. [no date] *Livestock and Poultry Waste Management*. 2nd Revised Printing. OFA, Toronto, Ontario. ISBN 0-7778-1244-4. 49 pp.

OFA. 1997. *No-Till: Making it Work*. OFA, Toronto, Ontario. Available spring. 60 pp.

OFA. [no date] *Nutrient Management*. 2nd Printing. OFA, Toronto, Ontario. ISBN 0-7778-2684-4. 68 pp.

OFA. 1997. *Pesticide Storage, Handling and Application*. OFA, Toronto, Ontario. 48 pp.

OFA. [no date] *Soil Management*. 2nd Revised Printing. OFA, Toronto, Ontario. ISBN 0-7778-2686-0. 68 pp.

OFA. [no date] *Water Management*. OFA, Toronto, Ontario. ISBN 0-7778-2361-6. 68 pp. [Set of 200 slides also available.]

OFA. 1997. *Water Wells*. OFA, Toronto, Ontario. 48 pp.



[Introductory sections and descriptions online at <http://www.res.agr.ca/lond/gp/bmp/bmpmenu.html>]

#### 4. Farm Planning and Farm-level Assessment

In the United States, “farm plans” and “conservation plans” developed by farmers with the guidance of USDA Soil Conservation Service specialists have been in service longer than most whole-farm assessment programs. Farm plans are to help fix, minimize or avoid problems, to maintain or enhance already implemented practices, and to establish time lines for implementation. The objective of farm-level assessment is evaluation of *status quo* and of changes to prevent and correct problems, primarily related to ground and surface water protection. Many whole-farm evaluation programs incorporate an action plan component. As these evolve, there will probably be little distinction—most programs will include comprehensive and detailed evaluation components to motivate users to plan and prioritize actions and will provide guidance on needed changes.

##### 4.1 Farm Planning

In farm planning, goal setting and outcomes, rather than monitoring and assessment, are the primary objectives. Some of these tools may include assessment, but mainly are for planning purposes. Many farm planning programs are supported by or developed by regulatory agencies attempting to streamline farmer compliance for multiple regulations with one plan. Great Lakes Basin Comprehensive Farm Planning is lead by a 26-member steering committee of representatives from sustainable agriculture and conservation organizations in the Midwest and upper Midwest, including Ontario, Canada. Holistic Management® is a private sector program designed by an expert on grazing and grassland ecosystems with organizations and affiliates in five countries as well as several states and regions in the United States. Ranch Management is a private sector program specialized in sustainable ranching. Idaho One Plan and Pennsylvania One Plan are cooperative public and private sector programs that lead to compliance with environmental and agricultural regulations in the respective states. New York City Watershed Agricultural Program Whole-Farm Planning was developed in collaboration by city officials, farmers, state and federal conservation agencies and Cornell University Cooperative Extension and aims to reduce impacts by 550 farmers on New York City’s reservoirs in the Catskill Mountains. The Skaneateles Lake Watershed Agricultural Program is a pilot program for managing farm environmental impacts on the New York City Watershed, targeted to impact level. Whole farm planning - Australia is a list of publications from that country.

##### Great Lakes Basin Comprehensive Farm Planning

*Contact:* John Lamb, The Minnesota Project, 1885 University Avenue West, Suite 315, St. Paul, MN 55104, (612) 645-6159; FAX (612) 645-1262; water007@gold.tc.umn.edu

*Contacts by State:* Full addresses of 26 steering committee members from Indiana, Michigan, Minnesota, New York, Ohio, Ontario, Pennsylvania, and Wisconsin online at <http://www.centers.agri.umn.edu/misa/swfp.html>.

*Purpose:* regulatory compliance, public recognition, education and motivation, quality of life

*Format:* Promote farm planning by providing information on elements of the process and plan. Explains goals of farm profitability, reductions in soil erosion and water pollution, and improved management of nutrients, pests and pesticides. Describes 10 topics related to goals to be addressed in all action plans, and lists eight more for consideration according to farm characteristics.

*Publications:* Kemp, L. 1996. *Successful Whole-farm Planning: Essential Elements Recommended by the Great Lakes Basin Farm Planning Network*. 18 pp. lkemp@maroon.tc.umn.edu [Online at <http://www.centers.agri.umn.edu/misa/swfp.html>]

*The Whole-farm Planner*, various issues. [Bimonthly newsletter detailing innovations, experiences, and policies on whole-farm planning, by state]. Online [http://www.centers.agri.umn.edu/misa/wfpv\\_n\\_.html](http://www.centers.agri.umn.edu/misa/wfpv_n_.html), where user should fill in \_ with volume and issue number.

### Holistic Management® (formerly Holistic Resource Management®)

*Contact:* 1. Center for Holistic Management, 1010 Tijeras NW, Albuquerque, NM 87102, (505) 842-5252; FAX (505) 843-7900; charm@igc.apc.org

2. Larry Johnson, certified Holistic Management educator, Minneapolis, MN; sawater@aol.com

*Purpose:* education and motivation

*Format:* Participants pay a fee to attend workshops that assist with personal, economic, environmental and social goal setting. Management options are evaluated in terms of moving the farmer closer to the goals set. Does not specifically address regulatory compliance.

*Publications:* Center for Holistic Management. 1990. *Holistic Resource Management Workbook*. 181 pp.

Center for Holistic Management. [no date]. *Holistic Management Financial Planning Software*.

### Ranch Management

*Contact:* Ranch Management Consultants, Inc., 7719 Rio Grande Blvd., NW, Albuquerque, NM 87107, (505) 898-7417; FAX (505) 898-9368; RMCALBQ@aol.com

*Purpose:* education and motivation

*Format:* Planning process follows workbook. Each chapter is a lesson with a self-test on the lesson material, followed by forms or worksheets on ranch conditions, characteristics, history, and management or production practices.

*Publications:* Parsons, S., and D. Pratt. 1991. *Ranching for Profit: Self-study Course* Albuquerque, NM: RMC, Inc. [workbook with cassette tape]

### Idaho One Plan

*Contact:* Warren McFall, proj. coord., US Environmental Protection Agency Region 10, 1200 6th Ave., Seattle WA 98101; (208) 378-5759 or 1-800-424-4372 [Online at <http://www.idwr.state.id.us/oneplan>, the Idaho Farm and Ranch Resource Center]

*Purpose:* regulatory compliance, education and motivation

*Format:* User accesses main web site <http://www.idwr.state.id.us/oneplan/planning/...> (“...” is replaced with specific subdirectory or file names) to download worksheets and instructions for completing a farm plan. Introduction to farm planning is provided (replace “...” with [plan\\_int.htm](#)). Checklists are given for physical inventory data to evaluate availability of planning materials (replace “...” with [invent\\_1.htm](#), [invent\\_2.htm](#), and [invent\\_3.htm](#)) and for identifying and describing field problems (replace “...” with [swapa.htm](#)). Worksheets and directions for farm plan objectives (replace “...” with [work.htm](#)), natural resource assessment (replace “...” with [nat\\_res.htm](#)), economic evaluation (replace “...” with [economic.htm](#)), and decision making (replace “...” with [decide.htm](#)). Sample action plans and documentation are provided (replace “...” with [docum.htm](#) and [/templates/template1.htm](#)). Self-help EasyGuide assessments are available, but not yet officially approved by government for: Cropland, Livestock, Rangeland/Pasture Management, Water Quality, Forest Management, Best Management Practices, Pest Management, Petroleum and other Storage Tanks, Spills, Well Construction, Endangered Species, Wetlands, Organic Farming, Waste Handling and Disposal, and Financial. Respondents answer a series of yes-no questions about the farm or ranch related to compliance with requirements and use the information learned to assist in planning. Multiple state and federal agency involvement.

*Publications:* Worksheets, checklists and text online at <http://www.idwr.state.id.us/oneplan/planning/...>

Easyguides online at <http://www.idwr.state.id.us/oneplan/index>.

#### Pennsylvania One Plan

*Contact:* Barry Frantz, Pennsylvania Association of Conservation Districts, 225 Pine St., Harrisburg, PA 17101, (717) 236-1006; FAX (717) 236-6410; [cnbrfantz@aol.com](mailto:cnbrfantz@aol.com); [pacd.conservation@a1.dep.state.pa.us](mailto:pacd.conservation@a1.dep.state.pa.us)

*Purpose:* regulatory compliance, education and motivation

*Format:* Planning process has no standardized format. Farmer sets goals and agency representatives and crop consultants develop recommendations for meeting goals while protecting the environment. Plans implemented through the program are certified to be in compliance with applicable environmental regulations, with restrictions on liability protection by agency.

*Publications:* see *Contact*

#### New York City Watershed Agriculture Program Whole-farm Planning

*Contact:* Watershed Agricultural Council, RR 1, Box 74, NYS 10, Walton, NY 13856-9751, (607) 865-7790; FAX (607) 865-4932; [wac@cce.cornell.edu](mailto:wac@cce.cornell.edu)

*Purpose:* regulatory compliance, education and motivation

*Format:* Respondent sets business goals and fill out an Environmental Audit worksheet, identifying practices or situations in eleven assessment categories that are potentially harmful to water quality. Designed to identify problems and determine solutions that prevent or contain pollution at the source or that protect streams and rivers from overland contamination. Agency personnel propose changes in current practices and evaluate them against the farmer’s business goals, selecting best practices and creating an integrated farm plan from them. Time line and cost schedule for implementation are developed. City of New York pays for

structural changes, on average about \$75,000 per farm among those evaluated. Plans meet all requirements of state and federal water quality laws.

*Publications:* Coombe, R. 1994. *Watershed Protection: A Better Way*, WAC, New York. 9 pp.

Farrell, M. 1996. Protecting city water on the farm. *Biocycle* (March):42-48.

WAC. Various. *Watershed Agricultural News* (newsletter)

WAC. [all undated]. *Whole-farm Planning* (pamphlet), *Inventory* (form), *Whole-farm Planning Guide, Vol. III* (manual)

WAC. 1996. *Whole-farm Planning* (booklet)

WAC. 1996. *Environmental Review/Problem Diagnosis*, (assessment instrument). 30 pp.

The Skaneateles Lake Watershed Agricultural Program (Whole-farm Pilot Project)

*Contact:* Dick Dale, New York Sustainable Agric. Working Group, 392 Locke Rd., Groton, NY 13073; ddale@clarityconnet.com

*Purpose:* regulatory compliance, education and motivation

*Format:* Three-tier process. In Tier 1, respondents complete a questionnaire to identify potential environmental risks. If there are none, the respondent exists the process. If potentially harmful practices are identified, the respondent enters Tier II, which includes an environmental assessment using a series of worksheets to specify problems. The farmer remedies minor problems with assistance from private consultants or extension agents. Farmers with more complex problems enter Tier III, and develop full-scale New York City Watershed plans comply with water quality requirements and to integrate farm business goals with environmental goals. Success of the pilot program may lead to statewide adoption.

*Publications:* see *Contact*

Whole farm planning - Australia

*Publications:* Campbell, A. 1987. *Whole-farm Planning: a Handbook for Farmers*. Potter Farmland Plan. Univ. of Melbourne, Victoria, Australia.

Campbell, A. 1988. *Bridging the Gap Between Conventional and Sustainable Agriculture: the Role of Whole-farm Planning and Land Management*. Univ. of Melbourne, Victoria, Australia.

Garret, B.K. 1989. *Whole-farm Planning: Principles and Options*. Saltforce, Dept. of Conservation, Forests, and Lands, Benalla Region, Victoria, Australia.

Negus, T.R. 1986. *An Introduction to Conservation Farm Planning*. Farmnote No. 15/86, Western Australia Dept. of Agriculture.

## 4.2 Farm-level Assessment—Qualitative

Qualitative farm-level assessments are most commonly used as a basis for planning and self-evaluation.

These stress nonquantitative indicators rather than scores for determining the sustainability status of the farm. These instruments do not hold out a standard to meet, instead offering more general parameters that allow for individual farm conditions. Private sector involvement in developing or testing these instruments is another common factor. The American Farm Bureau's Self-Help Checklists, the Harmony Farm Program and the Land Stewardship Project's Monitoring Project encourage farmers to take a systems approach to meeting environmental and economic goals. More comprehensive, government-initiated programs, such as NASDA Resource Management Planning and Ontario Environmental Farm Plan were formulated with review by client teams and public meetings to assess the reactions of farmers, crop advisors, and others. The Ontario program includes assistance in farm planning and implementation, with workshops administered by the Ontario Soil and Crop Improvement Association and action plan reviews by locally appointed farmers.

This voluntary program had 5,000 participants as of September 1995.

### American Farm Bureau Self-Help Checklists

*Contact:* American Farm Bureau Federation, 225 Toughy, Park Ridge, IL 60068, (312) 399-5883

*Purpose:* education and motivation

*Format:* Four checklist booklets are available. Respondents complete checklists in the booklets and read about considerations and methods for appropriate use of technology, chemicals, integrated pest management and water quality protection.

*Publications:* American Farm Bureau. 1993. *Farm Bureau's Water Quality Self-Help Checklist*. Natural and Environmental Resource Division, AFB, Park Ridge, IL. 15 pp.

Porterfield, J.W., H.S. Johnson, and S.D. Rawlins. 1990. *Farm Bureau's Professional Self-Help Education Series Part I: Agricultural Technology*. AFB, Park Ridge, IL. 25 pp.

Rawlins, S.D., H.S. Johnson, J.W. Porterfield, and S.N. Newton. 1990. *Farm Bureau's Professional Self-Help Education Series Part II: Chemical Use*. AFB, Park Ridge, IL. 51 pp.

Sorensen, A.A. 1990. *Farm Bureau's Professional Self-Help Education Series Part III: IPM*. AFB, Park Ridge, IL. 87 pp.

### Harmony Farms Program

*Contact:* Foundation E.A.R.T.H. [Environment, Agriculture, Research & Technology in Harmony] 675 St. Clair, Suite 2000, Chicago, IL 60611, (312) 649-0911; FAX (312) 649-0949; 1-800-EARTH-01; [Online at <http://farm.fic.niu.edu/earth/home.html>]

*Purpose:* outreach, public recognition, education and motivation

*Format:* Respondent answers 37 yes/no questions about practices used in pest management, nutrient management, water management and conservation, erosion control, farmstead and family safety, hazardous materials handling, livestock and animal waste management, and wildlife habitat. Any "no" responses are

identified are “weak links” in the farm management program, and respondent is directed to further information about changing practices. Available online where it is unmonitored and confidential. Selected farms are demonstration farms in the program, and descriptions are posted online. Participation in the demonstration program requires evaluation of practices and management.

*Publications:* Foundation E.A.R.T.H. 1995. *Harmony Farms Self-Assessment* [Draft]. 16 pp [Online at <http://farm.fic.niu.edu/earth/test/selfassesstest.html>]

### Land Stewardship Project Monitoring Project

*Contact:* Richard Ness, Land Stewardship Project, 180 E. Main St., Box 130, Lewiston, MN 55952, (501) 523-3366; FAX (501) 523-2729

*Purpose:* education and motivation

*Format:* A “Tool Box” of suggested financial, social and biophysical indicators for monitoring farm management. Design is informal, flexible and individualized, with emphasis on recording personal observations. Participants are encouraged to document observations with photos, maps, diary/logbook, sketches, graphs, *etc.* In development, not generally available before early 1998.

*Publications:* Land Stewardship Project. [no date] *Monitoring Sustainability Fact Sheet*, 2 pp.

Land Stewardship Project. [no date] *Monitoring Tool Box* [information sheet]. 2 pp.

The diversity of life on the farm. 1996. *The Minnesota Volunteer*. (Jan-Feb):19-20,22

A team approach to observation. 1996. *The Land Stewardship Letter*. (Oct-Nov):11.

### NASDA Resource Management Planning

*Contact:* National Association of State Departments of Agriculture (NASDA), 15th Street, N.W., Suite 1020, Washington, DC 20005, (202) 296-9680; [nasda@patriot.net](mailto:nasda@patriot.net); [http://www.nasda-hq.org/nasda/nasda/Foundation/foundation\\_main.htm](http://www.nasda-hq.org/nasda/nasda/Foundation/foundation_main.htm)

*Purpose:* education and motivation, program eligibility, regulatory compliance

*Format:* Preparatory material on farm planning includes worksheets for describing short term and long term objectives in natural resources, farm economics, meeting program requirements and legal regulations, and protecting health and safety. Physical inventory forms for evaluating information needs for planning are provided. Sample plan documents, maps and actions plans are provided. Evaluation and assessment tools consist of worksheets for farm/ranch assessment and for assessing risk to groundwater.

Worksheets for farm/ranch assessment of cropland, pastureland and rangeland, woodland, wetlands and other stewardship concerns. Worksheets for assessing risk to groundwater from drinking water well condition, pesticide storage and handling, fertilizer storage and handling, petroleum product storage, hazardous water management, household wastewater treatment and livestock waste storage. Each worksheet includes introductory material answering the questions: Why should I be concerned? and How will this worksheet help me? Glossary of terms used in the assessment included for each worksheet. Respondent ranks resource

concerns for each worksheet topic 4 (low potential impact on groundwater and productivity, resource enhancement), 3 (low to moderate risk, resource maintenance), 2 (moderate to high risk, controlled resource degradation) or 1 (high risk, uncontrolled resource degradation). Lists of resource concerns and descriptions of observable actions and conditions are provided, with space provided for adding other concerns.

Designed for Midwestern farms and ranches, recommended that modifications be made for other areas as needed. Materials development team includes representatives USDA Natural Resources Conservation Service, Cooperative Extension, USEPA, National Association of Conservation Districts, USDA Farm Services Agency, Farm\*A\*Syst and the National Association of State Departments of Agriculture Research Foundation. Client Review Team represented by American Farm Bureau Foundation and national commodity and livestock organizations.

*Publications:* NASDA. 1996. *Appendix A. Producer's Guide to Resource Management Planning*. [Worksheets for plan objectives, physical inventory, natural resource assessment and decision-making, sample materials for planning]

NASDA. 1996. *Appendix B: Farmstead Assessments*. [Worksheets 1-7 on assessing groundwater risk]

NASDA. 1996. *Appendix C: Farm/Ranch Assessments*. [Worksheets for resource assessment]

[Online at [http://www.nasda-hq.org/nasda/nasda/Foundation/foundation\\_main.htm](http://www.nasda-hq.org/nasda/nasda/Foundation/foundation_main.htm). Click on "Conservation and Environment Programs"]

### Ontario Environmental Farm Plan - Canada

*Contact:* 1. David Armitage (Secretary, Ontario Environmental Farm Coalition) Ontario Federation of Agriculture, 40 Eglinton Ave., East, 5th Floor, Toronto, Ontario, M4P 3B1 Canada, (416) 485-3333; FAX (416) 485-9528; ofarsch@flexnet.com; <http://www.res.agr.ca/lond/gp/gphompag.html>

2. Harold Rudy, Ontario Soil & Crop Improvement Assoc., 1st Floor, 1 Stone Road West, Guelph, Ontario NT N1H 6N1 Canada; (519) 826-4214; 1-800-265-9721 (Ontario only); oscia@wat.hookup.net; <http://www.tdg.ca/ontag/oscia>

*Purpose:* education and motivation, program eligibility

*Format:* Formal process includes: 1) attend a free Environmental Farm Plan (EFP) workshop, at which workbook is provided, 2) complete a self-assessment, 3) develop an Action Plan, 4) submit the EFP for confidential review by locally appointed farmers who offer suggestions, 5) implement the plan. Self-assessment worksheets cover 23 areas: soil and site evaluation, water wells, pesticide storage and handling, fertilizer storage and handling, storage of petroleum production, disposal of farm wastes, treatment of household waste water, livestock yards, silage storage, milking centre washwater, noise and odour, water efficiency, energy efficiency, soil management, nutrient management in growing crops, manure use and management, horticultural production, field crop management, pest control, stream, ditch and floodplain management, wetlands and wildlife ponds, and woodlands and wildlife. Participant answers the 5 to 19 questions on worksheets that apply to the farmstead, rating the potential for environmental damage from 1 (poor, high risk) to 4 (best, little risk). Using BMP worksheets and information in the EFP packet, participant develops and action plan, submits it for confidential peer review, and implements the approved plan with up to CAN\$1500 in financial assistance.



*Publications:* Ontario Federation of Agriculture. 1995. *Our Farm Environmental Agenda*. OFA, Toronto, Ontario. 28 pp.

Ontario Federation of Agriculture. 1995. *Environmental Farm Plan Program*. OFA, Toronto, Ontario. 7 pp.

Ontario Federation of Agriculture. 1994. *Ontario Farm Plan Workbook*. OFA, Toronto, Ontario. 215 pp.

*GLBCFP Network Ontario Profile*. 1996. 6 pp.

### 4.3 Farm-level Assessment—Quantitative

Quantitative farm-level assessment allows the farmer to calculate scores or values that measure sustainability. While it is difficult to evaluate environmental protection in these terms, the Farm\*A\*Syst program enables farmers to assign themselves a number value for rating their systems. Economic criteria are more easily quantified. Assessment materials have been distributed to about 60,000 farms or homes in 29 states. Economic assessment methods may use combined indexes of environmental risk and economic profitability, or may use comparative evaluation of farm systems using multiple criteria. While these methods are usually presented in academic journals, they are relatively easy to implement using a computer spreadsheet or handwritten worksheets. The economics listing represents only a small sample of the financial-based comparisons. The review by Roberts and Swinton is a good starting point for sources.

Other multicriteria methods underlie computer assisted approaches. By combining many specific components (yield goals, crop, production practices, farm characteristics) with crop growth simulators and budgeting software, comprehensive crop management expert systems have been developed. Listed here are whole-farm planning and assessment tools with components for determining the potential for environmental impacts. This software helps farmers choose among systems that offer environmental protection with economic profitability. Organic Farming Software emphasizes biological pest control options and is under development. Crop Rotation Planning System (CROPS) highlights rotation management and is being tailored for an expanded set of crops. PLANETOR™ Environmental and Economic Farm Planning Software builds on successfully implemented software programs from the Center for Farm Financial Management and is in the second version.

#### Farm\*A\*Syst

*Contact:* Liz Nevers, Outreach Specialist, (enevers@facstaff.wisc.edu), Farm\*A\*Syst Program (Farm Assessment System) National Office, B142 Steenbock Library, 550 Babcock Drive, Madison, WI 53706-1293, (608) 265-2774; FAX (608) 265-2775; farmasyst@macc.wisc.edu; <http://www.wisc.edu/farmasyst>

*Purpose:* education and motivation

*Format:* Participant scores practices used in systems being assessed according to environmental risk criteria.

Scores from 1 (poor, high risk) to 4 (best, low risk) are averaged across equally weighted assessment categories such as nutrient management, petroleum storage and handling, broiler management, etc. Scores for individual categories might also be used to identify problem areas, but the program is set up to evaluate the entire farming system. Worksheets are specific to states. Among the more comprehensive state programs are those in Arkansas, Florida, and Wisconsin. For exemplary individual assessments, see Wisconsin's dairy, Arkansas' poultry, and Idaho's irrigation assessments.

*Publications:* See *Contact*. Listings for each of 47 state programs and an onscreen slide show overviewing the program are online at <http://www.wisc.edu/farmasyst>.

#### Economic assessment

*Contact:* see *Publications*

*Purpose:* education and motivation, advisor training

*Format:* System comparison or assessment using economic and environmental criteria.

*Publications:* Irwin Hewitt, T., and L. Lohr. 1995. Economic and environmental simulation of alternative cropping sequences in Michigan. *Journal of Sustainable Agriculture* 5:59-86.

Levins, D. 1996. *Monitoring Sustainable Agriculture with Conventional Financial Data*. Land Stewardship Project, White Bear, MN. 29 pp.

Lohr, L., O. B. Hesterman, J. J. Kells, D. A. Landis and D. R. Mutch. 1992. Methodology for designing and evaluating comparative cropping systems. *Journal for Farming Systems Research-Extension*, 3:105-129.

Roberts, W.S., and S.M. Swinton. 1996. Economic methods for comparing alternative crop production systems: a review of the literature. *American Journal of Alternative Agriculture*. 11(1):10-17.

Teague, M.L., H.P. Mapp, and D.J. Bernardo. 1995. Risk indices for economic and water quality tradeoffs: an application to Great Plains agriculture. *Journal of Production Agriculture* 8(3):405-415.

### Organic Farming Software

*Contact:* Thomas Wittman or Steve Salter, Organic Farming Software, 8315 Hermosa Ave., Ben Lomond CA 95005; twittman@aol.com

*Purpose:* advisor training, education and motivation

*Format:* Provide assistance in whole-farm planning of organic systems. In development. For more information see *Contact*.

*Publications:* see *Contact*.

### Crop Rotation Planning System (CROPS)

*Contact:* Rosalind D. Buick or Nick Stone, Information Systems & Insect Studies, Dept. of Entomology, 202 Price Hall, Virginia Tech Univ., Blacksburg, VA 24061-0319, (703) 231-9116 or (703) 231-6885; FAX (703) 231-3982

*Purpose:* education and motivation

*Format:* Computer program for generating multi-year, whole-farm management plans based on ecologically sound practices. Determine optimal rotations by comparing alternative plans having up to three crops per field per year, including cover crops. Assists farmers in complying with federal and state land-use requirements. Integrates income- and crop-production goals with field-by-field environmental risk assessments based on data such as soil nutrient levels, topographic details, yield and input history and other economic information. Forecasts agronomic and environmental results for each site, such as expected yields, annual soil loss and pesticide leaching potential. The program will be improved to be more flexible for vegetable growers who prefer to make decisions closer to planting time.

*Publications:* Southern Region SARE/ACE Program. 1995. CROPS, the crop rotation planning system for whole-farm environmental and economic planning. In *1995 Annual Report*. 203 Stuckey Building, 1109 Experiment St., Georgia Station, Griffin, GA 30223-1797. pp. 61-62.

PLANETOR™ Environmental and Economic Farm Planning Software

*Contact:* Center for Farm Financial Management, Dept. Agric. and Applied Economics, Minnesota Extension Service, University of Minnesota, 1994 Buford Avenue, St. Paul, MN 55108, (612) 625-1964 or 1-800-234-1111; cffm@cffm.agecon.umn.edu; <http://www.cffm.umn.edu/cffm/planetor.htm> [Demo available online]

*Purpose:* advisor training, education and motivation

*Format:* Software for comprehensive environmental and economic farm planning for croplands. Designed for cooperative extension. Calculates the potential for soil erosion, pesticide leaching and runoff, pesticide toxicity, nitrogen leaching and phosphorus runoff based on system practices and farm characteristics. The program predicts the economic impacts of changes in pesticide use, tillage, nutrient management or crop rotations. Soils and chemical toxicity data are included. Incorporates FINPACK™ type software for financial analysis. Training programs in software use are offered annually at the University of Minnesota.

*Publications:* Center for Farm Financial Management. 1995. *PLANETOR™ User's Manual*. Dept. of Agric. and Applied Econ., Minnesota Extension Service, Univ. of Minnesota. 117 pp.

*Related publications on planning software:* Stone, N.D., Buick, R. D., Roach, J.W., Scheckler, R.K., Rupani, R. 1992. The planning problem in agriculture: farm-level crop rotation planning as an example. *AI Applications* 6(1):59-75.

Vanden Ende, E. *et al.* 1996. Gabi: a computer-based decision support system for integrated pest management in Dutch apple orchards. *Integrated Pest Management Review* 1(3):147-162.

## 5. Environmental Impact Assessment: Pesticide Ratings

Environmental Impact Assessment (EIA) is the process of identifying and characterizing the biological and physical impacts of human activities on habitats or ecosystems. The usage of the term in this document is restricted to the impacts of agrichemicals, particularly pesticides, and to assessment methods suitable for farmers and other pesticide users. Descriptions of some approaches that are useful for farm decision making are given here.

The adverse effects of a pesticide depend on the properties of the pesticide, the manner in which it is used, the conditions present when applied, and the amount of active ingredient in the application. Pesticide properties include biological behavior (toxicity to nontarget organisms) and physico-chemical behavior (soil sorption, water solubility and persistency or half-life). These are relevant for exposure of soil and aquatic organisms and users of potentially contaminated water. While most approaches account for pesticide properties, few account for manner of use, that is, the way in which the material is applied (e.g., in-furrow, via irrigation, airplane, in-field sprayer). Other exposure parameters that rarely are taken into account include temperature, time of day, proximity to surface water, depth to groundwater and wind speed. The pesticide yardstick developed by the Centre for Agriculture and the Environment (CLM) in The Netherlands is an exception in its inclusiveness.

Pesticide EIA information for farmers is typically summarized in a single rating that can be qualitative or quantitative. Qualitative methods do not take application rates into consideration. With the Environmental Impact Quotient, characteristics of pesticides in recommended uses are assessed. For the Environmental Yardstick Systems, legal limits and computer simulation are built into the calculation of the impact under specified use conditions. Information on pesticides is compiled into databases, such as the Extension Toxicology Network (EXTOXNET), that can be accessed online for quick reference. Potential impacts may affect regulatory compliance, and Organic Expert was developed to aid in evaluating chemicals for acceptability under organic standards.

### Environmental Impact Quotient (EIQ)

*Contact:* Joe Kovach, IPM Program, Cornell University, New York State Agric. Experiment Station, Geneva, NY 14456, (315) 787-2209; FAX (315) 787-2360; jk14@nysaes.cornell.edu

*Purpose:* education and motivation; advisor training

*Format:* EIQ values measure relative potential for environmental impact. Rating for each pesticide is compared to other pesticides that are labeled for the same application. No comparison to an external standard and no qualitative categories such “highly toxic” or “least toxic” are used. Examples of EIQ development include field crops (University of Guelph, Ontario), apples (University of Minnesota), turf (North Carolina State University and Vermont Dept. of Agriculture), pome fruit (Oregon State University), fruit (New Zealand).

*Publications:* Dushoff, J., B. Caldwell, and C.L. Mohler. 1994. Evaluating the environmental effect of pesticides: a critique of the environmental impact quotient. *American Entomologist* 40:180-184.

Kovach, J., C. Petzoldt, J. Degni, and J. Tette. 1992. A method to measure the environmental impact of pesticides. *New York's Food and Life Science Bulletin* 139:1-8. [Online at

[http://nysaes.cornell.edu/ipmnet/ny/program\\_news/EIQ.html](http://nysaes.cornell.edu/ipmnet/ny/program_news/EIQ.html). The published paper includes EIQ data on 122 pesticides; the online version has more than 200.]

Levitan, L., I. Merwin, and J. Kovach. 1995. Assessing the relative environmental impacts of agricultural pesticides: the quest for a holistic method. *Agriculture, Ecosystems, and Environment* 55:153-168.

*Related publications on indexes:* Becker, R.L., D. Herzfeld, K.R. Ostlie, and E.J. Stamm-Katovich. 1989. *Pesticides: Surface Runoff, Leaching, and Exposure Concerns*. Bulletin AG-BU-3911. Minnesota Extension Service, University of Minnesota. 32 pp.

Britt, J.K., S.E. Swinell, and T.C. McDowell. 1992. Matrix decision procedure to assess new pesticides based on relative groundwater leaching potential and chronic toxicity. *Environmental Toxicology and Chemistry* 11:21-728.

Goss, D.W. 1992. Screening procedure for soils and pesticides for potential water quality impacts. *Weed Technology* 6:701-708.

Gustafson, E.I. 1989. Groundwater ubiquity score: a simple method for assessing pesticide leachability. *Environmental Toxicology & Chemistry* 8:339-357.

Hassan, S.A. et al. 1983. Results of the second joint pesticide testing programme by the IOBC/WPRS Working Group on Arthropods. *Zeitschrift für angewandte Entomologie*. 95:151-158. [In German]  
[Author's address: Biologische Bundesanstalt für Land- und Forstwirtschaft, Institut für biologische Schädlingsbekämpfung, Heinrichstr. 243, D-6100 Darmstadt. Federal Republic of Germany ]

Hassan, S.A. et al. 1986. Results of the third joint pesticide testing programme by the IOBC/WPRS Working Group on Pesticides and Beneficial Organisms. *Zeitschrift für angewandte Entomologie*. 101:?. [In German]

Hassan, S.A. et al. 1988. Results of the fourth joint pesticide testing programme by the IOBC/WPRS Working Group on Pesticides and Beneficial Organisms. *Journal of Applied Entomology*. 105:321-329.

Hassan, S.A. et al. 1991. Results of the fifth joint pesticide testing programme by the IOBC/WPRS Working Group on Pesticides and Beneficial Organisms. *Entomophaga*. 36(1):55-67.

Jury, W.A., D.D. Focht, and W.J. Farmer. 1987. Evaluation of pesticide groundwater pollution potential from standard indices of soil-chemical adsorption and biodegradation. *Journal of Environmental Quality* 16(4):422-428

Klein, A.W., J. Goedicke, W. Klein, M. Herrchen, and W. Kördel. 1993. Environmental assessment of pesticides under directive 91/414/EEC. *Chemosphere* 26(5):979-1001.

Linders, J.B.H.J., and R. Luttik. 1995. Uniform system for the evaluation of substances. *Chemosphere*. 31(5):3237-3248.

Metcalf, R.L. 1975. Insecticides in pest management. In R.L. Metcalf and W.H. Luckman (eds.), *Introduction to Insect Pest Management*. New York: Wiley. pp. 235-273.

Newman, A. 1995. Ranking pesticides by environmental impact. *Environmental Science & Toxicology* 29(7):324-326.

Pierce, C.R., and J. Anderson. 1996. *Minnesota Rating for Potential Leaching and Surface Runoff of Pesticides*. Minnesota Extension Service, Univ. of Minnesota, USA. FO-5758. 7 pp.

Seelig, B. [No date] *An Assessment System for Potential Groundwater Contamination from Agricultural Pesticide Use in North Dakota*. Extension Bulletin no. 63, North Dakota State Univ. Extension Serv. 9 pp. [Includes a 3-page listing of pesticide filtration potentials—the opposite of leaching potential—using a graduated, qualitative scale with three categories]

### Environmental Yardstick for pesticides - The Netherlands

*Contact:* Joost Reus, Centre for Agriculture and Environment (CLM), Box 10015, 3505 AA Utrecht, The Netherlands, 31-30-2441301; FAX 31-30-2441318; jreus@clm.nl or clm@gn.apc.org

*Purpose:* education and motivation, regulatory compliance, marketing

*Format:* Pesticides are assigned pollution points or environmental impact points (EIP) based on computer-simulated risk to three components: aquatic organisms, soil biota and groundwater contamination. EIP allocate a “yardstick” of 100 points based on one kilogram active ingredient per hectare, which is adjusted for the actual rate used on a field. Risk is based on the percentage of the legally acceptable concentration that an application imposes in the environmental components. For example, if the legally acceptable concentration of water pollutants is 0.10 the  $LC_{50}$  for the most sensitive aquatic organism, an application expected to produce a concentration that is 0.50 is five times the limit, so the EIP is 500 points. For ground water, 100 impact points represents a level of 0.10 micrograms per liter total pesticide concentration. Calculation of EIP incorporates properties and quantity applied of a pesticide, as well as circumstances of application such as soil type, water flow, season, etc. A nutrient (fertilizers + feedstuffs) yardstick is also available. Agricultural yardsticks are being developed for biodiversity and energy.

*Publications:* Buys, J.C. 1995. *Towards a Yardstick for Biodiversity on Farms*. 101 pp. [In Dutch; English summary, 5 pp.] order no. CLM 169-1995.

Joosten, L.T.A. 1995. Clean drinking water, healthy farming: Dutch farmers and drinking water companies get together. Text of address to the Vereniging van Waterleidingexploitanten in Nederland - VEWIN (Dutch Water Suppliers' Association). July 1, 1995, Korle, Nordhessen, Germany.

Reus, J.A.W.A., and G.A. Pak. 1993. An environmental yardstick for pesticides. *Mededelingen van Faculteit Landbouwwetenschappen, Rijksuniversiteit, Gent*. 58(2a):249-255.

Verhoeven, J.T.W., G.A.A. Wossink, and J.A.W.A. Reus. 1994. An environmental yardstick in farm economic modeling of future pesticide use: the case of arable farming. *Netherlands Journal of Agricultural Science* 42(4):331-341.

*Related publications on regulation and whole farm assessment:* Higley, L.G., and W.K. Wintersteen. 1992. A novel approach to environmental risk assessment of pesticides as a basis for incorporating environmental costs into economic injury level. *American Journal of Entomology* 39: 34–39.

Hoag, D.L., and A.G. Hornsby. 1992. Coupling groundwater contamination with economic returns when applying farm pesticides. *Journal of Environmental Quality*. 21:579-586.

Hornsby, A.G. 1992. Site-specific pesticide recommendations: the final step in environmental impact prevention. *Weed Technology* 6:736-742.

Pease, W.S., J. Liebman, D. Landy, and D. Albright. 1996. Pesticide use in California: Strategies for reducing environmental health impacts. California Policy Seminar, 2020 Milvia St., Ste. 412, Berkeley, CA 94704. Tel: (510) 642-5514. 116 pp.

Riha, S., L. Levitan, and J. Hutson. 1996. Environmental impact assessment: the quest for a holistic picture. Third National IPM Symposium/Workshop, February 27 - March 1, 1996, Washington, DC.

Schmidt-Bleek, F., and M.M. Marchal. 1993. Comparing regulatory regimes for pesticide control in 22 countries: toward a new generation of pesticide regulation. *Regulatory Toxicology and Pharmacology* 17:262-281.

Van der Werf, H.M.G. 1996. Assessing the impact of pesticides on the environment. *Agriculture, Ecosystems, and Environment* 60(2-3):81-96.

#### Environmental Yardstick for pesticides - USA

*Contact:* Jim Kleinschmit or Emily Green, Institute for Agriculture and Trade Policy, 2105 1st Avenue South, Minneapolis, MN 55404, (612) 870-0453; FAX (612) 870-4846; jkleinschmit@iatp.org or egreen@iatp.org or iatp-info@iatp.org; <http://www.igc.apc.org/iatp/>

*Purpose:* education and motivation

*Format:* Implementation of environmental yardstick program similar to the CLM Dutch yardstick. Nutrient management yardstick on demonstration farms in Minnesota, Wisconsin, New York and Nebraska.

*Publications:* see *Contacts*. Description online at <http://www.igc.apc.org/iatp/waterfood.html>

#### Extension Toxicology Network (EXTOXNET)

*Contact:* Online at <http://ace.ace.orst.edu/info/extoxnet/>. Or telnet to ace.orst.edu, at 'login' type 'lynx' + press <enter> for 'password' prompt. Select 'G)o' (type 'G') and enter the URL ace.orst.edu/info/extoxnet.

*Purpose:* education and motivation, advisor training

*Format:* Science-based information about pesticides written for the non-expert. User links to Pesticide Information Profiles for summary information and references on 172 chemicals, to Toxicology Information Briefs that describe environmental and human health effects, and to newsletters, factsheets, and discussions on issues of concern.

*Publications:* see *Contact*



*Related publications on databases:* Goss, D.W., and R.D. Wauchope. 1990. The SCS/ARS/CES pesticide properties database: II. Using it with soils data in a screening procedure. pp. 471-493 in D.L. Weigmann (ed.), *Pesticides in the Next Decade: the Challenges Ahead*. Proc. 3rd Natl. Res. Conf. on Pesticides, Nov. 8-9, 1990. Virginia Water Research Center, Blacksburg, VA, USA. 831 pp.

Herner, A.E. 1992. The USDA-ARS pesticide properties database: a consensus data set for modelers. *Weed Technology*. 6:749-752. [Database online at <http://www.arsusda.gov/ppdb2.html> or at <http://waffle.nal.usda.gov/agdb/arsppdb.html>]

Theiling, K.M., and B.A. Croft. 1988. Pesticide side-effects on arthropod natural enemies: a database summary. *Agriculture, Ecosystems, and Environment* 21:191-218

### Organic Expert

*Contact:* 1. Lynn Coody, Organic Agsystems Consulting, 3460 McMillan St., Eugene, OR 97405, phone/FAX (541) 343-6795; [lynncoody@compuserve.com](mailto:lynncoody@compuserve.com)

2. Michael Hankin, National Organic Program, TMD/AMS/USDA, Rm. 2510, Box 96456, Washington DC 20090-6456; (202) 720-3252

*Purpose:* regulatory compliance

*Format:* Prototype for making determinations of materials ratings (permitted, restricted, prohibited) for organic standards. Designed to assist the Technical Advisory Panel of the National Organic Standards Board. Computerized.

*Publications:* USDA-AMS. Sept. 29, 1995 Press Release, 4 pp.

Coody, L. [no date] *Designing a Prototype* 35 pp. [Review of EIA methods, discussion of data used, introduction to computerized evaluation system]

Coody, L. [no date] *Organic Expert*. 340 pp. [Details of design and use of the expert system]

*Related publications on simulation:* Crowe, A.S., and J.P. Mutch. 1994. An expert system approach for assessing the potential for pesticide contamination of ground water. *Ground Water* 32(3):487-498.

Wauchope, R.D. 1992. Environmental risk assessment of pesticides: improving simulation model credibility. *Weed Technology* 6:753-759.

## 6. Assessment Implementation: Certification and Labeling Programs

Assessment methods listed in previous sections have had as their primary goal farmer education and motivation, environmental protection and regulatory compliance. Some programs were designed as marketing programs, set up to assure consumers of certain quality attributes related to how commodities are produced. These production systems are valued by consumers because they are perceived to be better for the environment and more sustainable than noncertified methods. So-called 'green labeling' is proliferating, sometimes to the confusion of consumers. A few examples are given in this section.

### 6.1 Organic Certification for Crops

Organic certification for agricultural products is one of the best known programs. There are numerous government, trade and private certifying organizations. Most groups publish a list of accepted, prohibited and restricted materials and practices, and require record keeping and on-farm inspection for certification. Field-level assessment and farm planning are also underlying components. In many countries, multiple certifiers offer inspection and labeling and the farmer may choose among them according to market penetration of the label, cost of certification, and other factors. An international consortium of certifying entities—the International Federation of Organic Agriculture Movements (IFOAM) coordinates information exchange and facilitates expansion of certification programs. Appropriate Technology Transfer for Rural Areas (ATTRA) provides information about production practices that meet certification standards in the U.S. The Independent Organic Inspectors Association (IOIA) provides training for certifiers. The Organic Crop Improvement Association (OCIA) is one of the largest certifying organizations, with chapters throughout the world. Contacts listed can supply introductory material in English.

#### International Federation of Organic Agriculture Movements (IFOAM) - Germany

*Contact:* International Federation of Organic Agriculture Movements (IFOAM), c/o Ökozentrum Imsbach  
D-66636 Tholey-Theley, Germany, Tel: +49 6853 5190; FAX +49 6853 30110;  
ifoam-secretary@oln.comlink.apc.org; <http://ecoweb.dk/ifoam/index.html>

*Purpose:* marketing certification, education and motivation

*Format:* Umbrella organization for 530 member organizations and institutions in 95 countries. Guidelines for certifying organizations, membership implies consistency with IFOAM standards. Supports information exchange, conferences, educational opportunities and expansion of organic certification.

*Publications:* IFOAM. [current] *Ecology and Farming* [magazine], Tholey-Theley, Germany.

IFOAM. 1996. *Organic Agriculture Worldwide* [1996-1997 membership directory], Tholey-Theley, Germany, 54 pp.

IFOAM. 1996. *Basic Standards for Organic Agriculture and Processing and Guidelines for Coffee, Cocoa and Tea; Evaluation of Inputs*. Tholey-Theley, Germany, 42 pp.

Schmidt, H., and Haccius, ?. 1993. *EEC Regulation "Organic Agriculture" - Market Access for Third Countries and a Comparative View of Codex Alimentarius, EEC and USA Regulations*. IFOAM, Tholey-Theley, Germany, 104 pp. [Includes list of approved inspection organizations in Europe]

IFOAM. [various years] *Proceedings of the International IFOAM Conferences*, and *Proceedings of the International IFOAM Conference on Trade in Organic Products*, Tholey-Theley, Germany.

Appropriate Technology Transfer for Rural Areas (ATTRA)

*Contact:* Appropriate Technology Transfer for Rural Areas (ATTRA), Box 3657, Fayetteville, AR 72702, 1-800-346-9140; (501) 442-9824; FAX: (501) 442-9842; askatttra@ncatfyv.uark.edu

*Purpose:* education and motivation, marketing certification

*Format:* A national sustainable farming information center located at the University of Arkansas. The center provides information on certification, but is not a certification agency. Managed by the National Center for Appropriate Technology (NCAT). Funded wholly through legislative appropriations by the U.S. federal government.

*Publications:* ATTRA. 1992. *Organic Certification: Information Package*. Fayetteville, AR, 23 pp.

ATTRA. 1994. *Marketing Organic Livestock Products*. Fayetteville, AR.

ATTRAnews. [quarterly newsletter].

Independent Organic Inspectors Association (IOIA)

*Contact:* Jim Riddle, Independent Organic Inspectors Association, Route 3, Box 162C, Winona, MN 55987, tel./fax: (507) 454-8310; jriddle@luminet.net

*Purpose:* marketing certification

*Format:* Nonprofit professional association of organic farm and process inspectors. Over 200 members from 12 countries. Provides training.

*Publications:* see *Contact*. Annual membership directory, quarterly newsletter, organic inspection manual.

Organic Crop Improvement Association (OCIA)

*Contact:* 1. Organic Crop Improvement Association, National Office (OCIA), 1405 South Detroit St., Bellefontaine, OH 43311, (513) 592-4983; FAX (513) 593-3831; ociaintl@bright.net

2. OCIA International, 1001 Y St., Suite B, Lincoln, NE 68508-1172, (402) 477-2323; FAX (402) 477-4325.

*Purpose:* marketing certification

*Format:* U.S. directorate of the international certifying body. Grassroots organization started in 1984, now with 20,000 grower-members and 200 corporations (processors, manufacturers, traders and brokers) in 65 chapters in 25 countries. Certifies chapters, chapters certify growers and corporations.

*Publications:* OCIA. 1996 *International Certification Standards*. [Online at <http://www.gks.com/library/standards/ocia/ociain.html>]

*Related publications on organic certification:* AgAccess. 1995. *U.S. Certification Organizations and Local Chapters*. Davis, CA. [Only available online at <http://organics.com/resources/resc.htm> and at <http://freenet.macatawa.org/org/ogm/orgcert.htm>]

Community Alliance with Family Farmers. 1996. *National Organic Directory*. CAFF, P. O. Box 363, Davis, CA 95617, (916) 756-8518, 1-800-852-3832; FAX: (916) 756-7857; [nod@caff.org](mailto:nod@caff.org); [www.caff.org](http://www.caff.org) [Updated annually]

*Related publications on consumer demand for organics:* Collins, J.K., G.W. Cuperus, B. Cartwright, J.A. Stark, and L.L. Ebro. 1992 Consumer attitudes on pesticide treatment histories of fresh produce. *Journal of Sustainable Agriculture* 3(1):81-98.

Jolly, D.A., and K. Norris. 1991. Marketing prospects for organic and pesticide-free produce. *American Journal of Alternative Agriculture* 6(4):174-179.

Jolly, D.A., H.G. Schutz, K.V. Diaz-Knauf, and J. Johal. 1989. Organic foods: consumer attitudes and use. *Food Technology* 43(11):60-66.

Ott, S.L., C.L. Huang, and S.K. Misra. 1991. Consumers' perception of risk from pesticide residues and demands for certification of residue-free produce. In J.A. Caswell (ed.), *Economics of Food Safety*. New York: Elsevier Publ. pp.175-188.

## 6.2 Organic Certification for Processed Goods

Processed commodities require additional inspection and record keeping, as processing, packaging, storage, handling and shipping, as well as the raw materials, of the goods are certified. Food and nonfood products may receive certification. Many of the organizations that certify raw food products also certify processed goods, such as International Federation of Organic Agriculture Movements (IFOAM). Regional certification is exemplified by Nordic Environmental Labeling. Labeling for processed goods has been more heavily regulated in Europe than in the U.S., but leadership has been provided by groups such as the Organic Trade Association.

### International Federation of Organic Agriculture Movements (IFOAM) - Germany

*Contact:* International Federation of Organic Agriculture Movements (IFOAM), c/o Ökozentrum Imsbach D-66636 Tholey-Theley, Germany, Tel: +49 6853 5190; FAX +49 6853 30110; ifoam-secretary@oln.comlink.apc.org; <http://ecoweb.dk/ifoam/index.html>

*Purpose:* marketing certification

*Format:* Guidelines for processed textiles.

*Publications:* IFOAM. 1996. *Proceedings of the Second International IFOAM Conference on Organic Textiles*. Tholey-Theley, Germany. 180 pp.

IFOAM. 1996. *International Organic Textile Directory*. Tholey-Theley, Germany.

### Nordic Environmental Labeling - Finland

*Contact:* Nordic Council of Ministers, SFS Miljömärkning, Box 116, FIN-00241 Helsinki, Finland. +358 149 9331; FAX: +358 149 93320

*Purpose:* marketing certification

*Format:* Guidelines for processed textiles.

*Publications:* Nordic Council of Ministers. 1994. *Nordic Environmental Labeling: Eco-labeling of textiles, Criteria, Dec. 16, 1994 – Dec. 31, 1997*. 25 pp.

Rainey, M. 1994. *Textiles and Clothing: Environmental Impact of Production and Criteria for Environmental Labeling, a Report for the Swedish Standards Institution*. Rainey Consulting, Stockholm, Sweden. 64 pp.

### Organic Trade Association

*Contact:* Katherine DiMatteo, exec.dir., Organic Trade Assoc., P.O. Box 1078, Greenfield, MA 01302, (413) 774-7511; FAX: (413) 774-6432; [ota@igc.apc.org](mailto:ota@igc.apc.org)

*Purpose:* marketing certification, education and motivation

*Format:* Membership of growers, retailers, manufacturers, certifiers, distributors, brokers, consultants and others. Committees for Legislative, Quality Assurance, International Relations, Marketing and Membership.

*Publications:* OTA. [current] *The Organic Report*. Monthly newsletter. Greenfield, MA.

### 6.3 Environmental Labeling

Besides organics, other types of labels draw attention to environmental protection in the production process.

The impetus for this labeling is to create niches and recognition for commodities produced in more environmentally sensitive ways than conventional products. Environmental organizations sometimes sponsor or cooperate in these labeling efforts, lending expertise in establishing certification standards. The Rainforest Alliance is collaborating with environmental and agricultural organizations in South and Central America to certify tropical food products in the ECO-O.K. Certification Program. The South Carolina chapter of the

Sierra Club is sponsoring the South Carolina Farm Labeling Project to develop an ecolabel for South Carolina commodities. Mothers & Others for a Livable Planet is starting a cooperative effort with Virginia Association of Biological Farmers to establish a farm product label and an electronic marketing network in the Virginia Green Label program. Internationally, the Agro-Milieukeur Environmental Certification program grew out of a national ecolabelling program for nonfood products.

#### ECO-O.K. Certification Program

*Contact:* Eric Holst or Sabrena Rodriguez, Rainforest Alliance, 65 Bleecker Street, New York, NY 10012-2420, (212) 677-1900; FAX (212) 677-2187; eholst@ra.org or srodriguez@ra.org;  
<http://www.rainforest-alliance.org/>

*Purpose:* marketing certification, education and motivation

*Format:* Program certifies tropical agricultural products according to environmental and social criteria developed from research on environmentally-friendly production and input from government, industry, scientists and environmentalists. Certification criteria address conservation of vegetative cover, agrochemical management, forest conservation, wildlife protection, waste management, new development, environmental education, training and research, and compliance with national laws. Programs have been established for bananas, coffee, oranges and cocoa. Certification is being developed for mangos, brazil nut harvesting, fern growing, sugar cane, and ecotourism. Certification is individualized by conditions in each country, most of which are Central and South American.

*Publications:* see *Contact*. Online at: [www.rainforest-alliance.org/okr.html](http://www.rainforest-alliance.org/okr.html)

#### South Carolina Farm Labeling Project

*Contact:* Diane Jowers, Farm Project Coordinator, 325 Clinton Church Rd., Salley, SC 29137, (803) 564-6770; jjowers@PBTCComm.Net

*Purpose:* marketing certification, outreach

*Format:* Preliminary, standards under development based on environmental criteria, with emphasis on protection and enhancement of wildlife habitat and soil quality. Certification will be through farmer self-assessment followed Cooperative Extension Service and/or university review. The project will be piloted in Lexington Co. (Columbia, SC) with state agencies, universities and farmer organizations participating. Certification for fruits and vegetables.

*Publications:* see *Contact*

Virginia Green Label

*Contact:* 1. Eugenia Anderson-Ellis, Buy Green Virginia, 2702 East Grace St., Richmond, VA 23223, (804) 643-3915; FAX (804) 643-6363

2. Virginia Assoc. of Biological Farmers (VABF), Box 10721, Blacksburg, VA 24062-0721

*Purpose:* marketing certification

*Format:* Preliminary, standards under development for five categories of differentiated produce - certified organic, biological, low-input, IPM, and soil and water conservation. Proposed label is "Virginia Green" and electronic marketing network "BuyGreen" is planned.

*Publications:* see *Contact*

Agro-Milieukeur Environmental Certification - The Netherlands

*Contact:* Agro-Milieukeur, Stichting Milieukeur, Eisenhowerlaan 150, 2517 KP The Hague, the Netherlands, phone +31 70 3586300; FAX +31 70 3502517

*Purpose:* marketing certification

*Format:* see *Contact*

*Publications:* Stichting Milieukeur, *The Dutch Ecolabel (Milieukeur) Added Value for Products and the Environment*, 11 pp.

Bouwman, G.M. *et al.* 1993. *Towards an Agro-environmental Certification: environmental criteria for agricultural products*. CLM 116-1993. 76 pp. [Dutch with English summary. Available from the Centre for Agriculture and Environment, Box 10015, 3505 AA Utrecht, The Netherlands, +31-30-2441301; FAX +31-30-2441318; clm@gn.apc.org]

de Vries, J. 1996. Sustainable farming in Holland: green labels and environmental yardsticks. *Pesticide News* 33(Sept.):6.

*Related publications on ecolabelling:* The Hartman Group. 1996. *The Hartman Report, Food and the Environment: a Consumer's Perspective, Phase I (1996) and Phase II (1997)*. 10422 S.E. 14th St., Bellevue, WA 98004, (206) 451-9094; FAX (206) 452-1506 or (206) 382-1464; hartma29@nwlink.com

Lefferts, L.Y. 1996. *Green Food Labels: Emerging Opportunities for Environmental Awareness and Market Development*. 35 pp. Mothers & Others for a Livable Planet, 40 West 20th St., 9th Floor, New York, NY 10011-4211, (212) 242-0010 ext. 307; FAX (212) 242-0545; 1-888-ECOINFO

National Wildlife Federation. 1996. *Guarding the Green Choice: Environmental Labeling and the Rights of Consumers*. 20 pp. NWF Trade and Environment Program, 1400 16th St., NW, Washington, DC 20036, (202) 797-6603; FAX (202) 797-5486; prudencio@nwf.org [Summary online: <http://www.nwf.org/nwf>]



van Ravenswaay, E. O., and J. R. Blend. 1997. Using ecolabeling to encourage adoption of innovative environmental technologies in agriculture. Staff Paper 97-19. Dept. of Agric. Econ., Michigan State Univ., East Lansing, MI.

*Related publications on demand for IPM produce:* Anderson, M.D., *et al.* 1996. Consumer Response to integrated pest management and certification. *Agriculture, Ecosystems, and Environment* 60:97-106.

Bruhn, C., S. Petersen, P. Phillips, and N. Sakovith. 1992. Consumer response to information on integrated pest management. *Journal of Food Safety* 12:315-326.

Burgess, R., *et al.* 1989. Results of IPM marketing survey. Proceedings of the 51st Annual New York Pest Management Conference, Cornell University, Ithaca, New York, USA.

Grant, J., J. Tette, C. Petzoldt, and J. Petzoldt. 1990. Feasibility in an IPM-grower recognition program in New York State. New York State IPM Program Bulletin, No.3. Cornell Univ., Ithaca, New York.

Hollingsworth, C.S., W.M. Coli, and V. Van Zee. 1992. Massachusetts grower attitudes towards a certification program for integrated pest management. *Fruit Notes* 57(4):7-11.

Hollingsworth, C., W. Coli, and V. Van Zee. 1995. Growing green, selling green: a conference exploring green marketing trends in the food industry. *Fruit Notes* 60(2):11-14.

Hollingsworth, C.S., M.J. Paschall, N.L. Cohen, and W.M. Coli. 1993. Support in New England for certification and labeling of produce grown using integrated pest management. *American Journal of Alternative Agriculture* 8(2):78-84.

Ikerd, J.E. 1995 The role of marketing in sustainable agriculture. University of Missouri, Columbia, Missouri, USA. Paper presented at 87th Annual Meeting of American Society of Agronomy, St. Louis, MO. Oct. 29-Nov. 3, 1995. [Available at: <http://www.ssu.missouri.edu/faculty/jikerd/papers/stl-mkt.htm>]

Paschall, M.J., C.S. Hollingsworth, W.M. Coli, N.L. Cohen. 1992. Attitudes and perceptions of New England consumers and the food industry toward a certification program for integrated pest management. *Fruit Notes* 57(4): 3-6.

Underhill, S.E., and E.E. Figueroa. 1993. Consumer preferences for non-conventionally grown produce A.E. Staff Paper 93-07, Dept. of Agricultural Economics, Cornell University, Ithaca, New York.

van Ravenswaay, E., and J.P. Hoehn. 1991. Consumer willingness to pay for reducing pesticide residues in food: results of a nationwide survey. Staff Paper 91-18, Dept. Agric. Econ., Michigan State Univ., East Lansing, MI.

## 6.4 Public Recognition Programs

Assessment programs may be used as a basis for public recognition programs designed to recognize the environmental stewardship efforts of individual farmers or more generally of the agricultural industry. Since some of the assessment tools are intended to serve in a marketing program for a differentiated product, the distinction between marketing strategies, public outreach and public recognition of grower stewardship efforts can become blurred. Many of the programs listed in earlier sections have a public recognition component. For those described here, public recognition and public outreach are the primary emphases. In most cases, recognition programs are supported by industry groups and private corporations. The Pesticide Environmental Stewardship Awards are coordinated by the National Potato Council in collaboration with several utilities, U.S. Apple Association and American Corn Growers Association. The Farming for Maximum Efficiency Program (MAX®) is a national program to recognize America's most efficient farmers supported by *Successful Farming* magazine, Monsanto, Case, Bayer, the U.S. Natural Resources Conservation Service and the Conservation Technology Information Center. The River-Friendly Farmer Program is supported by the Minnesota Alliance for Crop Residue Management and ten other entities including state and federal agencies and agribusiness. Careful By Nature is a program of the Cotton Foundation funded by Ciba Crop Protection.

### Pesticide Environmental Stewardship Awards

*Contact:* National Potato Council, 5690 DTC Boulevard, Suite 230E, Englewood, CO 80111-3200, (303) 773-9295; potato@npcspud.co; <http://www.npcspud.com/>

*Purpose:* public recognition, outreach

*Format:* see *Contact*. Environmental stewardship programs in pest, fertilizer and water management. .

*Publications:* see *Contact*.

### Farming for Maximum Efficiency (The MAX®)

*Contact:* themax@www.agriculture.com; <http://www.agriculture.com/contents/sf/max/maxindex.html>

*Purpose:* public recognition, education and motivation

*Format:* Farmers enroll in the program, collect actual crop production and harvest data and send it to local, state or national coordinators for processing and ranking. Efficiency in different tillage systems, pesticide selections and fertilizer programs are calculated and the participant receives a summary report on efficiency of the operation, plus a ranking of participants in the state and a comprehensive program report. Awards are made based on efficiency by the program coordinators. In the first five years, soil conservation benefits related to tillage were emphasized. In 1996, the economic efficiency of biotechnology, precision farming practices and nutrient management were added. Targeted to producers of corn, soybeans, small grains and other crops in the Midwest. Participants receive software, summary report, field worksheet and recognition certificate. Sponsored by corporations including Monsanto, *Successful Farming* magazine, and USDA Natural Resources Conservation Service and administered by the Conservation Technology Information Center.

*Publications:* Walter, J. 1995. Headed in the right direction: The MAX confirms wisdom of conservation tillage in a variety of crops. *Successful Farming* 93(April). [Online at [http://www.agriculture.com/contents/sf/max/sf\\_article.html](http://www.agriculture.com/contents/sf/max/sf_article.html)]

Walter, J. 1996. Four years running: Four years of farms' numbers crunching shows profitability of conservation tillage. *Successful Farming* 94(April). [Online at <http://www.agriculture.com/contents/sf/max/sfarticle96.html>]

Walter, J. 1997. MAX® monitors profit: Producers use the MAX® to test whether high-tech practices put more grain in the bin and more profit on the bottom line. *Successful Farming* 97(April):34-36. [Online at: <http://www.agriculture.com/contents/sfonline/sf/1997/April/max/index.html>]

### The River-Friendly Farmer Program

*Contact:* 1. Don Olsen, Minnesota Extension Service, University of Minnesota, 146 Classroom Office Building, 1994 Buford Ave., St. Paul, MN 55108, (612) 625-9292; FAX (612) 624-4974

2. Michael Price, Natural Resource Conservation Service, 375 Jackson St., Suite 600, St. Paul, MN 55101, (612) 290-3677; FAX (612) 290-3375

*Purpose:* public recognition, outreach

*Format:* To be designated as a River Friendly Farmer, a Minnesota River basin farmer must meet ten criteria. Program goals are to publicize and promote farming practices that benefit Minnesota river water quality while maintaining the profitability of farming and to inform non-farm public about farmers' positive contributions to the clean-up of Minnesota's rivers.

*Publications:* see *Contacts*.

### Careful By Nature

*Contact:* Paul Dugger, Manager, Special Projects, National Cotton Council, Box 12285, Memphis, TN 38182-0285, (901) 274-9030; FAX (901) 725-0510; [pdugger@cotton.org](mailto:pdugger@cotton.org)

*Purpose:* public recognition, outreach, education and motivation

*Format:* Designed to raise the consciousness of cotton producers about the impact of their actions on the environment and motivate them to use pesticides responsibly, highlight success stories of responsible farmers, reassure the general public about responsible pesticide use. At the national level, a quarterly, two-page newsletter, *Just the Facts* is produced. State program in Alabama, Arizona, Georgia, Mississippi and Texas are independently administered farmer, Extension, and industry representatives. All cotton belt states are scheduled to participate in 1997.

*Publications:* see *Contact*.

*Related publications on recognition:* Van Zee, V. 1992. Partners With Nature: a Massachusetts Integrated Pest Management recognition program. *Fruit Notes* (Fall):23-24.



## 7.0 Applications in Forestry

Emphasis on sustainable forestry management has encouraged certification of green labels for forest products. Environmental protection standards and management recommendations support producer efforts to practice better stewardship. The Forest Stewardship Council Certification Program serves a coordinating role in standard setting and accreditation of certifiers. The Good Wood Alliance Certification Program provides comprehensive listing of certified producers. Some organizations certify only forest management systems, such as Canadian Sustainable Forestry Certification Coalition, but others support process, product and chain-of-custody certification as exemplified by Pacific Certified Ecological Forest Products, Smart Wood Program, Community Forestry, Forest Conservation Program, QUALIFOR, and the Responsible Forestry Program Woodmark. Most of these programs are more evolved and standardized than those for agriculture, and usually incorporate a community or rural development component as well as production certification.

### Forest Stewardship Council Certification Program - Mexico

*Contact:* Dr. Timothy Synnott, Exec. Dir., Forest Stewardship Council, Consejo de Manejo Forestal, Avenida Hidalgo 502, 68000 Oaxaca, Oaxaca, Mexico, Phone/fax: +52 (951) 621-10; fscoax@antequera.antequera.com; <http://antequera.com/FSC/index.html>. In the United States, contact FSC US Initiative: (802) 244-6257

*Purpose:* market certification

*Format:* The FSC accredits certifying organizations according to 10 management principles - compliance with laws and FSC principles, tenure and use rights and responsibilities, indigenous people's rights, community relations and worker's rights, benefits from the forest, environmental impact, management planning, monitoring and assessment, maintenance of natural forests, and plantations. Certified as of 1997 were Skal (Netherlands), Rainforest Alliance Smart Wood Program (USA), Scientific Certification Systems Forest Program (USA), SGS Forestry QUALIFOR Programme (UK), and Soil Association Responsible Forestry Program (UK).

*Publications:* FSC. 1996. *Forest Stewardship Council Principles and Criteria for Natural Forest Management*. Document no. 1.2. Oaxaca, Mexico. Online at <http://antequera.antequera.com/FSC/1-2.html>.

FSC. 1995. *FSC Process Guidelines for Developing Regional Certification Standards*. Document no. 1.4.3. Oaxaca, Mexico. Online at <http://antequera.antequera.com/FSC/1-4-3.html>.

FSC. [no date] *FSC Manual for Evaluation and Accreditation of Certification Bodies*. Oaxaca, Mexico.

### Canadian Sustainable Forestry Certification Coalition - Canada

*Contact:* Canadian Standards Association, 178 Rexdale Blvd., Etobicoke Ontario M9W 1R3 Canada, 1-800-463-6727 or (416) 747-2475; [coalition@sfms.com](mailto:coalition@sfms.com); <http://www.sfms.com/> or <http://www.csa.ca>

*Purpose:* marketing certification, education and motivation

*Format:* Accredits and registers forest management systems, not products. Criteria and principles for sustainability: conservation of biological diversity, maintenance and enhancement of forest ecosystem, condition and productivity, conservation of soil and water resources, forest ecosystem contributions to global

ecological cycles, multiple benefits to society, accepting society's responsibility for sustainable development. Independent third party audit required for registration. Local public input is solicited as part of the audit, and continued public participation in setting management objectives is required for maintaining accreditation. Standards are consistent with and complementary to the ISO 14001 Environmental Management System standard.

*Publications:* Canadian Standards Association. 1996. *A Sustainable Forest Management System: Guidance Document*. CSA-Z808-96. Etobicoke, Ontario.

Canadian Standards Association. 1996. *A Sustainable Forest Management System: Specifications*. CSA-Z809-96. Etobicoke, Ontario.

#### Good Wood Alliance Certification Program

*Contact:* Good Wood Alliance, P.O. Box 1525, Burlington, VT 05402-1525; FAX: (802) 658-4443; warp@together.net; <http://www.web.net/goodwood/>

*Purpose:* outreach and education, public recognition

*Format:* Information services and directory of certified producers, updated annually.

*Publications:* Good Wood Alliance. 1996. *Good Wood Directory*. [ Online at <http://www.web.net/goodwood/> ]

#### Pacific Certified Ecological Forest Products

*Contact:* Institute for Sustainable Forestry, P.O. Box 1580, Redway, CA 95560, (707) 923-4719; FAX (707) 923-4257; [isf@igc.apc.org](mailto:isf@igc.apc.org)

*Purpose:* marketing certification, education and motivation

*Format:* Technical assistance, education, outreach targeted to private landowners of small parcels. Promotes watershed planning and long-term ecological and economic protection of forest communities in Northwest California.

*Publications:* see *Contact*.

#### Smart Wood Program

*Contact:* Helena Albuquerque or Richard Z. Donovan, Director, Rainforest Alliance, 65 Bleecker Street, New York, NY 10012-2420, (212) 677-1900; FAX (212) 677-2187; [smartwood@igc.apc.org](mailto:smartwood@igc.apc.org); <http://www.rainforest-alliance.org/>

*Purpose:* marketing certification, regulatory compliance, eligibility

*Format:* Certification for producers of timber, processors and forest products from sustainable or well-managed operations of natural forest, plantations, commercial and small-scale "sources." Field review using either "Smart Wood Generic Guidelines for Assessing Natural Forests" or "Smart Wood Generic Guidelines

for Assessing Plantations” or when available, country or bioregional guidelines drafted in consultation with local experts (foresters, ecologists and social scientists) and organizations. Draft guidelines exist for Indonesia, Papua New Guinea and Lake States region of the U.S. Guidelines in development for Brazil, Costa Rica, U.S. Pacific Northwest and U.S. Northeast. Criteria for source certification are: long-term security for forest, maintenance of environmental functions, sustained yield forestry production, positive impact on local communities and existence of suitable forest management plans. Source classifications are “sustainable” for documented long-term strict adherence to Smart Wood principles and “well managed” for strong operational commitment to principles. Company certification for wholesalers, processors, retailers, brokers based on “chain of custody” audits confirming that certified wood is being used. Company classifications are “exclusive” for firms selling products made exclusively from Smart Wood certified sources and “non-exclusive” for companies selling products of mixed origins.

*Publications: see Contact.*

#### Community Forestry

*Contact:* Rogue Institute for Ecology and Economy, 762 A Street, Box 3213, Ashland, OR 97520 USA (503) 482-6031; FAX (503) 482-8581; <http://id.mind.net/~clc/ije1e.htm>

*Purpose:* marketing certification, education and motivation

*Format:* Certification for private non-industrial forests. Broad objectives in revenue, esthetic, taxes, equity and autonomy. Benefits package of price premium, log marketing cooperatives, management referral services and computer modelling tools offered to private landowners who certify.

*Publications: see Contact.*

#### Forest Conservation Program: Green Cross

*Contact:* Debbie Hammel, Scientific Certification Systems, The Ordway Building, One Kaiser Plaza, Suite 901, Oakland, California CA 94612, (510) 832-1415; FAX (510) 832-0359; [dhammel@scs1.com](mailto:dhammel@scs1.com)

*Purpose:* marketing certification

*Format:* Evaluation of forest management practices by teams of regional experts in forestry, forest ecology and socioeconomics. Criteria for certification are timber resource sustainability, forest ecosystem maintenance and financial and socioeconomic considerations. Structured protocol with performance scores for each of the three major criteria. To be certified “Well Managed,” an operation must score at least 80 or higher in the three categories, and meet or exceed threshold standards. Management strengths and deficiencies are highlighted and baseline performance data are established in the evaluation. Producers, manufacturers and retailers can extend the “Well-Managed” label via chain-of-custody certification requiring inventory controls and audits.

*Publications: see Contact.*

### QUALIFOR and Logtrack Programmes - UK

*Contact:* Frank Miller, SGS Forestry, Oxford Centre for Innovation, Mill Street, Oxford OX2 OJX, +44-0-1865-201212 or 44-0-1865-202345; FAX +44-0-1865-790441; <http://www.sgs.co.uk/forestry.htm>; [ap03@dial.pipex.com](mailto:ap03@dial.pipex.com)

*Purpose:* marketing certification

*Format:* International certification for forest management based on environmental sensitivity, social responsibility and economic viability, following Forest Stewardship Council guidelines. Major industrial firms to small-scale cooperatives participating in 18 countries including Argentina, Australia, Brazil, Gabon, Germany, Ghana, Guyana, Indonesia, Malaysia, Papua New Guinea, Poland, Solomon Islands, South Africa, UK, Vietnam and Zimbabwe. Logtrak is a high technology system for supply chain tracking of logs and wood products from forest to final point of sale. Hand-held computers and bar-coded tags enable information gathering and chain-of-custody auditing.

*Publications:* see *Contact*.

### Responsible Forestry Programme Woodmark Scheme - UK

*Contact:* Jim Sandom, The Soil Association, 86 Colston Street, Bristol BS1 5BB, 44-117-929 0661; FAX: 44-117-925 2504; [rfp@gn.apc.org](mailto:rfp@gn.apc.org)

*Purpose:* marketing certification, education and motivation, outreach

*Format:* Certifies forests and processing chain managed to meet environmental, social and economic criteria. Auditing from forest to point of sale to verify origins of certified timber products.

*Publications:* see *Contact*.

*Related publications on forest certification:* Adams, T.O., D.D. Hook, and M.A. Floyd. 1995. Effectiveness monitoring of Silvicultural Best Management Practices in South Carolina. *Southern Journal of Applied Forestry* 19(4):170-176.

MacDonald, L.H., A.W. Smart, and R.C. Wissmar. 1991. *Monitoring Guidelines to Evaluate Effects of Forestry Activities on Streams in the Pacific Northwest and Alaska*. EPA/910/9-91-001. US EPA Water Div., Seattle, WA.

*Proceedings, UBC-UPM Conference on the Ecological, Social, and Political Issues of the Certification of Forest Management.* 1996. Held May 13-16, 1996 in Putrajaya, Malaysia. Sponsored by the Faculty of Forestry, Univ. Of British Columbia, Canada and the Faculty of Forestry, Univ. Pertanian, Malaysia. 314 pp. Contact Sandra Schinnerl, Conference Director at [sandra@unixg.ubc.ca](mailto:sandra@unixg.ubc.ca).

Upton, C., and S. Bass. 1996. *The Forest Certification Handbook: the Essential Guide to the Environmental Labeling of Wood Products*. Delrey Beach, FL: St. Lucie Press. 218 pp. [Includes descriptions of national programs in Austria, Brazil, Canada, Finland, Germany, Indonesia, The Netherlands, Sweden, and Switzerland.]