Ecological Pest Management, Deep Organics and Sustainability: Social Ecology and Psychosocial Perspectives

Stuart B. Hill[1]
Adjunct Professor & Foundation Chair of Social Ecology,
School of Education, University of Western Sydney, Penrith, NSW, Australia

Abstract

Ecology is concerned with the lives of, and relationships between, organisms within their environment; and particularly with their diversity, numbers, distribution and activities (especially their system-maintenance roles), and with the factors that influence these characteristics. Ecological approaches to pest management draw on this knowledge to design and manage ecosystems to:

1. make the crop (and habitat) unacceptable and resistant to pests by interfering with their oviposition preferences, host plant discrimination or location by both adults and immatures;

2. make the crop unavailable to the pests in space and time by utilizing knowledge of the pest's life history, especially its dispersal and overwintering habits; and

3. reduce pest survival on the crop by supporting its natural enemies, particularly by enhancing predator and pathogen evenness[2], and by reducing the crop's susceptibility to the pest[3].

This particularly involves doing things that favour the crop and the natural controls, and that discourage and impact on the pests.

Whereas 'deep' (design- and management-based) approaches to organic farming (and other 'alternative' agricultural systems[4]) aim to do the above, the more common 'shallow' organic approaches rely primarily on the use of the least disruptive and least toxic curative interventions (as substitutes for conventional synthetic biocides[5]). Only 'deep' approaches, which are likely to be most sustainable, will be discussed in this presentation.

It is equally important to consider the contexts in which such sustainable 'deep' initiatives can be implemented and further developed.

Pest control is a contested area, involving – in order of power – the pharmaceutical and petrochemical (and other agribusiness) industries, governments, and the community. Within the community, influencing our understanding and action, are the media, the various sectors within the food system (including producers and other natural resource managers, product handlers and distributers, and service providers), non-governmental and professional organisations, educators, researchers, and consumers.

---

[1] s.hill@uws.edu.au

[2] Crowder, DW, TD Northfield, MR Strand & WE Snyder 2010. Organic agriculture promotes evenness and natural pest control, *Nature* 466, 109–112 (Letter, 01 July); doi:10.1038/nature09183

[3] Hill, SB 2004. Redesigning pest management: a social ecology approach. Pp. 491-510 *in* D Clements & A Shrestha (eds). ***New Dimensions in Agroecology****,* Haworth, Binghamton, NY. See also: Gurr, GM, SD Wratten & MA Altieri (eds) 2004. ***Ecological Engineering for Pest Management: Advances in Habitat Manipulation for Arthropods***, CABI Publishing, Wallingford, UK; Gurr, GM, SD Wratten & WE Snyder (eds) 2012. ***Biodiversity and Insect Pests: Key Issues for Sustainable Management***, John Wiley & Sons, Chichester, UK.

[4] Hill SB (2012 – *in press*). Considerations for enabling the ecological redesign of organic and conventional agriculture: a social ecology and psychological perspective. *In:* S Penvern, S Bellon & I Savini (eds). ***Organic Farming: Prototype for Sustainable Agricultures***. Springer, London.

[5] Biocide is consciously used here rather than pesticide. Because pests are defined by their economic and nuisance properties, and because these characteristics cannot provide the basis for the selection of chemicals that are toxic to pests, the use of the term pesticide contributes to the common misconception that such chemicals can be specific to the pests, when in reality they are potentially toxic to all species (including humans), and usually more toxic to certain other species than the pests, particularly to their natural controls.

Current pest management perceptions and practices are the result of the progressive psychosocial evolution of our species, and of the influences of our past and present institutional structures and processes, including particularly those of our economic, political and social systems, the design and management of our natural resource systems (agroecosystems, etc), human competence and access to resources and technologies, and environmental conditions.

It is not surprising, therefore, that what is currently practiced, despite the commitments, good intentions and efforts of people such as yourselves, is far from ideal.

Optimal pest management is limited by the levels of empowerment, awareness, vision and values among all involved, and within the general population. As well as addressing these foundational factors, implementation will eventually require the following:

1. comprehensive knowledge, competence, wisdom, experience, the psychological health of all involved, and considerable commitment and courage (to resist acting in ways that are in conflict with our highest values, and to not postpone responsible action);

2. natural resource systems that are designed and managed to enable system health and wellbeing (with high levels of evenness among the natural controls, and among the species involved in system maintenance), and be as pest-proof as possible;

3. research and extension programs that prioritise the design and management of such systems, with the development of curative interventions being secondary, and being required to be supportive of, and minimally disruptive to, such systems; and

4. education and training programs being similarly supportive to the above criteria.

All of these areas need to be subjected to a critical evaluation as to what among present structures, processes and actions need to be:

- discontinued or reduced;
- retained;
- expanded or modified; and
- newly developed and introduced.

Institutional means to achieve this will involve the development and implementation of a broad range of:

- supports (ongoing);
- rewards (just available during transition periods); and
- penalties (to achieve compliance).

Because all of the above is ultimately limited (and enabled) by our psychological condition, this – and its improvement – will be the final focus of this presentation, together with suggestions for some helpful achievable actions that may be taken by all who are present today.

Abstract for presentation in the Symposium: Entomologie et agriculture biologique: de l'écologie à la pratique/Entomology and Organic Agriculture: from Ecological Principles to Practical Applications, to be held in Boucherville (Hotel Mortagne: www.hotelmortagne.com/en; 5 km from Montreal) as part of the 139th Annual Meeting of the Entomological Society of Québec/Société d'entomologie du Québec (SEQ: www.seq.qc.ca), 1-2 Nov, 2012. The symposium will almost coincide with the opening of IRDA's new facility devoted to R&D and outreach in organic farming in St-Bruno, Quebec (www.irda.qc.ca).