

¹The Ecological Agriculture Australia Association submission to the Senate Inquiry into Tertiary Agricultural Education.

This submission maintains that our method of agriculture/horticulture needs to change and that redesigning the type of pedagogy students are exposed to is a necessary step.

There is little doubt that the current methods of agriculture are energy and resource intensive. This has allowed us to farm large areas while reducing the manpower needed to do so. However, as energy costs rise and resources become more and more scarce this method of agriculture cannot continue. Further to this we are already seeing natural resistances to pest, disease and chemical weed control.

The next generation of farmers must be able to integrate knowledge from the current model of farming (conventional) and the various alternative agriculture methods in use today to create a sustainable system for the future. It is insufficient to expose students to facts which they must learn, instead we must develop in them a new way of thinking which engenders the ability to holistically assess a situation as well as reduce it into its component parts. This systems thinking can be created through an integrated curriculum of agro science, practical management techniques and importantly philosophy.

Students must understand the scientific principles, current methods of applying them and the ecological context in which they are to be used.

On the basis of this we have mapped out an appropriate ontology, epistemology and pedagogy for the next phase of tertiary agricultural education. Following this is an outline of the various goals that the curriculum needs to address.

¹ The Ecological Agriculture Australia Association is a new organisation formed in 2009 to advance an ecological approach to agriculture. The mission of the organisation can be seen at www.ecoag.org.au. while the mission and objectives of the education pillar of the organisation are outlined below:

Mission: To enhance all communities including the farming communities understanding of ecological agricultural principles and ways of thinking.

Objectives

To promote the teaching of ecological principles and ecological thinking skills at all levels of education.

To develop training packages to enable farmers and people not interested in a formal education to develop an understanding of ecological principles.

To provide input into the national agri-food industry skills council to enable development of training competencies and their inclusion in National training packages.

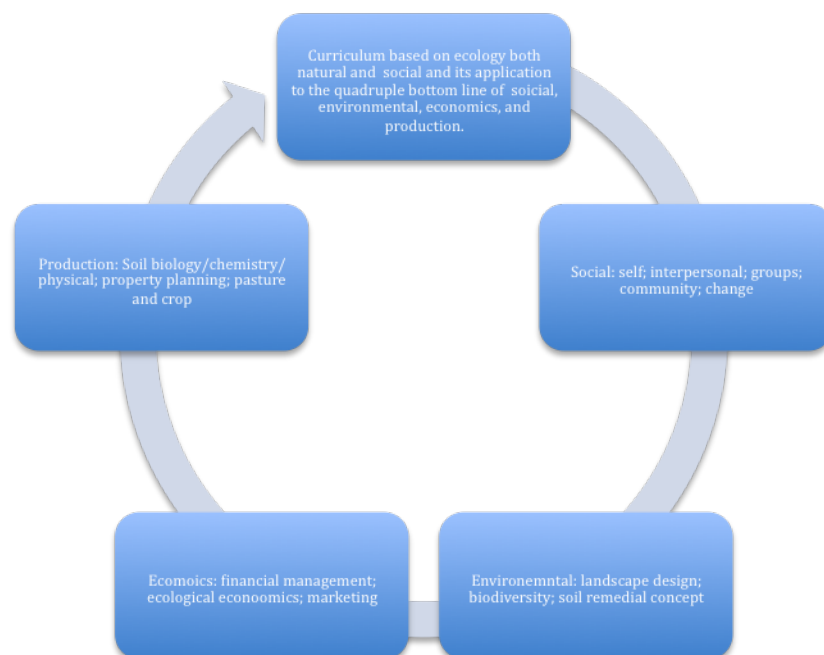
Provide easy teacher access to engaging ecological agricultural learning resources.

To support research endeavours into ecological approaches to food and fibre production or to seek funding to conduct the research.

Ontology: A C21 world will differ from the C20 in its emphasis on ecological ways of knowing and doing which embrace systems thinking and its approach towards holism. This implies a change in farming (less chemical inputs and greater knowledge at the farmer level re the ecology of soils, plants and microorganisms), a change in landscape management (with greater emphasis on biodiversity and ecological systems management), marketing (greater localism with a sensitivity towards farm miles/kilometres), community (restoring localism in marketing leading to stronger more viable rural communities), ethical standards (affecting the treatment of sentient and non-sentient forms), and farmers understanding of themselves, other people, and the wider natural world in which they operate.

Epistemology: A constructivist learning paradigm which draws on experiential learning as a central plank but with inputs from other learning approaches such as behaviourism and cognitivism as and when needed. The epistemology needs to enable students to take charge of their own learning and be able to manage complex issues with higher levels of certainty, if not creativity. Emphasis needs to be placed on rational and imaginative ways of knowing and the role of social engagement in the learning process.

Pedagogy: The pedagogy needs to be experiential where possible drawing on action upon which theory is developed. This is more likely to appeal to students of agriculture who have an activity based inclination. The most favoured pedagogy is to teach theory, which may or may not be connected with action, and this has little attraction to many students who are action oriented. In association with experiential learning is a constructivist approach to learning where students build their experiences into a set of learning outcomes. The ontology, the epistemology, and the pedagogy lead to four content streams of learning.



Given this background our concerns are as follows:

- The emphasis on conventional/industrial agriculture should be broadened to enable students to study a spectrum of agricultural pursuits including organics, permaculture, biological farming, and natural sequence farming.
- An ecological approach to farming should be included since it embraces natural and social ecology. This enables students to develop and understanding of the science of farming through the principles of ecology, and the role of the farmer and his worldview on farming techniques and outcomes.
- The focus on ecological approaches is timely given the ultimate demise of carbon fuelled energy sources and the associated risks re carbon dioxide emissions. Students need to not imitate the past in their studies but to think creatively about new ways of thinking about agriculture.
- Arguably the greatest issue facing agricultural decision makers is the default tendency of thinking in a boxed or reductionist way. Students need to be introduced to systems thinking and its significance including emergence.
- Associated with systems is biodiversity and its importance in the landscape. This needs to be a component of the curriculum. In association with the an ecological approach is the need to acquaint students with the notion of ecological services and their role and importance in agriculture
- Critical in their studies is an understanding of soil biology and its role in creating soil carbon. This point is surely one of the most significant changes to agriculture witnessed in recent times and likely to be part of agriculture in a significant way for some time to come. Particularly apparent in today's world is the resilience and soil building characteristics of regenerative systems.

We appreciate the opportunity to present a submission to the Senate Review Committee and look forward to viewing your recommendations in due course. Should you need any additional information please do not hesitate to contact us.

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