



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Soil health: The foundation of sustainable agriculture
Workshop proceedings, Wollongbar, 20-21 June 2001 - Readers' Note

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Soil health: the foundation of sustainable agriculture

Proceedings of a workshop on the importance of soil health in Agriculture

Wollongbar Agricultural Institute

20–21 June 2001

NSW Agriculture

Acid Soil Action

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The information contained in this publication is based on knowledge and understanding at the time of writing, June 2001. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Agriculture or the user's independent adviser.

Cover photo

The soil featured on the front cover is a relatively undisturbed ferrosol (formerly known as krasnozem) derived from basalt. Ferrosols are characterised by high organic matter, high iron content, deep topsoil and very good structure. The profile is located on the NSW north coast's Cudgen plateau, where intensive vegetable production takes advantage of some of Australia's most productive soils. The site was once cultivated but has not been disturbed for many years, and is currently under vegetation. There is a 20 cm A horizon or topsoil over the B horizon or subsoil. While there are few visual indicators of horizon change, laboratory analysis shows marked differences. Topsoil organic carbon is 5.68% compared with 1.96% in the subsoil 65-110 cm below the surface. Topsoil organic matter is 9.4% compared with 3.43% in the subsoil, and cation exchange capacity is 27.8 compared with 6.9 in the subsoil. Topsoil pH_{CaCl} is 6.1 compared with 4.5 in the subsoil. These analyses, together with the organic litter on the soil surface, the dark soil colour indicating humus, the depth of the soil, and the unobstructed root growth, are indicators of a healthy soil. Photo: David Morand DLWC Alstonville.

Foreword

How do you know if your soil is healthy? What are the characteristics and functions of healthy agricultural soils? These are broad questions that challenged scientists, farmers and consultants at a soil health workshop held over two days in June 2001 at Wollongbar Agricultural Institute. The workshop attracted interest from both farmers and specialists in soil biology, soil chemistry, soil physics, agronomy, horticulture, extension, plant pathology and microbiology. The program was organised into sessions on soil biology, soil chemistry, soil physics, farming systems, and extension. These proceedings collate more information than was possible to present at workshop and should serve as a valuable reference for the whole community.

The workshop aimed to review NSW Agriculture's soil health research and extension activities, identify general soil health issues, identify issues specific to different farming systems that need further attention, and identify strategies to address these issues.

Several key messages emerged from the workshop.

- Healthy agricultural soils are those used within their capability to enhance production without being degraded or degrading their environment.
- The biological, physical and chemical properties of healthy soils enable them to function with resilience to disturbances from agricultural practices and with minimum external inputs.
- To maintain and improve soil health it is necessary to plan for the long term and integrate best practice for erosion control, soil organic matter management, water and nutrient management, and pest and disease management into the production system.
- There needs to be more effective communication of soil health management.

The workshop presentations repeatedly identified that sustainable production systems build and maintain a healthy soil resource. As these proceedings demonstrate, NSW Agriculture has a broad range of expertise and is well positioned to assist agricultural industries and rural communities develop food and fibre production systems that are both economically and environmentally sustainable.

Peter Slavich
Director, Wollongbar Agricultural Institute

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Opening address

Helen Scott-Orr

**Executive Director, Research Advisory and Education
NSW Agriculture Orange**

I am very pleased to be at Wollongbar Agricultural Institute to open this two day workshop focussing on the issue of soil health. This workshop will highlight the fact that soil health is fundamental to productive agriculture. Soils are the basis of agriculture and the basis of our very existence.

NSW Agriculture has substantial investments in soil through specialised soils research and advisory staff as well as our wider agronomic, horticultural, livestock and veterinary staff. Increasingly, our soil chemists and physicists are being joined by scientists developing expertise in soil microbiology and soil entomology.

Many people think of soils as ‘just dirt’ and cannot imagine that they are interesting. But the study of microorganisms and wildlife in soil is a new frontier. We need someone like David Attenborough to put soils under the fibreoptic camera, and film the dynamic fascination of soil life for the world to see.

To fully understand soils, we need to get a better picture of the complexity of interactions between soil fauna like earthworms and beetles, microorganisms, the soil chemistry and physical attributes. A balanced interaction is the basis of healthy soil life, and therefore the basis of healthy food production.

Aside from highlighting the importance of soil health, this workshop will augment the investment NSW Agriculture and the community has in organic farming. Organic practices have developed from years of empirical observations. A requirement exists, now, to scientifically scrutinise many of these practices in order to verify benefits to soil health. Many of the organic practices are targeted at improving soil health and conventional agriculture can also learn from them.

The outcomes of this workshop will be made available at the Organic Farming Workshop at NSW Agriculture’s new Centre for Organic Farming at Bathurst in July 2001.

I would like to welcome everyone here today, congratulate the organisers for developing such a stimulating agenda, and declare this workshop open.