



# Koonunga sustainability and biodiversity project

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Koonunga and community members at Kleinig Ebenezer scrub during a biodiversity workshop. Photo: David Woodard

An ongoing project is empowering the people of Koonunga and surrounding areas to create a sustainable farming community.

The project, conducted by the Koonunga Agricultural Bureau, is helping to improve soil health and water management, enhance biodiversity and sustainability, and promote community engagement and awareness.

Koonunga, and the surrounding districts of Ebenezer, Moppa, Stockwell, St Kitts and Kalimna, are developing skills to investigate local issues, design and trial new techniques, discuss and evaluate methods, and learn from local and invited expertise in their district.

In its first year of operation the project has set a firm foundation to build on.

## Soil health

Vineyards and broadacre areas in the district have a plethora of soil health issues. Those identified were soil and water salinity, soil sodicity, non-wetting sands, compaction, low organic carbon and water

holding capacity, poor drainage, erosion, irrigation practices and soil acidity.

Soil investigations tested a range of soil types and locations, comparing poor performing areas to better growth areas to determine causal factors.

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Samples from layers down the profile from both types of areas were analysed. The results confirmed the problems expected but also identified new and unexpected problems.

Differences between comparison sites were often subtle and included factors that in combination were contributing to poorer growth.

In some areas, low organic carbon levels in the topsoil, indicating low soil organic matter levels, combined with low plant feeder roots activity, and thus biological activity, to reduce plant vigour.

At other sites, surface and sub-surface soil acidity had pH values of below 5 in calcium chloride solution. The low pH was affecting nutrient availability and plant growth.

Some sites had high sodic clay layers in the sub-soil restricting root growth and moisture infiltration, and thus net water availability. In other cases, sodicity was causing waterlogging, restricting root growth. High boron levels, likely to be toxic to plants, were found at some sites, which would restrict root growth. High boron was often found with elevated soil salinity in deeper subsoil layers.

With the facts at hand, the next step was to develop solutions through trials and demonstrations.

A rate of lime site was established on an acidic site to monitor the effect of application level on surface and sub-surface pH levels.

In a vineyard site, members established an extensive demonstration using mulches and composts with various application methods and rates, liming, additional irrigation



treatment, sub-soil treatments and a dung beetle treatment to address low surface organic matter, low pH and heavy textured sub-soil issues.

The project established a number of sub-soil modification sites following some Victorian research which had identified the dramatic effect on productivity of adding composts and manures to clay sub-soils. Sodic and heavy textured clay sites were treated using the technique in broadacre and vineyard areas.

This proof of concept work may take a number of seasons for the soil biology to work on the deposited materials and improve the structure of the surrounding clay, as it did in Victoria.

### Biodiversity

The biodiversity component focused on improving understanding and management of local biodiversity (including priority Peppermint Box grassy woodlands), revegetating with appropriate species and enhancing the remaining remnant vegetation and ecosystems.

A number of in-field workshops identified the range of vegetation systems in the district and viewed the changes of diversity by land type. Members visited grasslands, riparian areas, Peppermint Box grassy woodlands and native pine shrub lands all in close proximity to each other.

The workshops identified the flora and associated birdlife in each vegetation type, which enabled participants to see the value of biodiversity in their district. Special highlights were seeing some rare native orchids, and viewing and hearing about the range of birdlife in each vegetation type.

### Community

The community engagement and awareness component encourages the adoption of new research and best practice for the district, working together and communicating with all landholders, and maintaining the culture of 'looking out' for the neighbours.

The project also helped coordinate activities with other projects including the Northern Rivers management project (Light River component). Neighbouring members have now rehabilitated a length of an eroded and poorly vegetated section of creekline by fencing and re-establishing vegetation by tube stock and direct seeding local species.

### More information

For further information contact David Woodard PIRSA Rural Solutions 0417 803 525 or Jamie Nietschke, Koonunga Agricultural Bureau 0427 619 840.



Robert Lowke and Glen Becker of Ebenezer and Peter Kleinig of Koonunga (l-r) inspect Ebenezer subsoil modification plots sown to field peas. Photo: David Woodard



Brett Nietschke of Koonunga at the establishment of the lime application rate trial on the Nietschke family property. Photo: David Woodard