Mixed cover crops for sustainable farming

INFO

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Key messages

- **Crop intensive farming systems are running down soil carbon levels.**
- **Mixed species cover cropping offers a new approach to address the issue.**
- **Farmers lack the basic local knowledge to make informed decisions on incorporating cover crops into their farming systems.**

About the project

Crop intensive farming systems are running down soil carbon levels, requiring increased inputs to maintain or increase yield without necessarily improving profitability. Mixed species cover cropping offers a new approach in the Australian context. It is a key component of some farming systems overseas but is yet to be adopted widely in southern Australia. In the context of this project, mixed species cover crops refers to a diverse mix of plant species grown at the same time but often outside the main growing season to build fertile and resilient soils.

Benefits of cover crops include improving soil organic carbon, structure and health, while decreasing weed and disease levels for following crops, but these must be balanced against the cost of growing the cover crop and the water and nutrients it will use. Many potential cover crop options exist and while growers are beginning to investigate these, they lack the basic local knowledge to make informed decisions.

In this project, a consortium made up of the Ag Excellence Alliance, SANTFA, CSIRO and the Department of Environment and Water will support grower groups to demonstrate the establishment and management of mixed species cover crops across a range of environments in south eastern Australia. The impacts of cover cropping on soil health, nutrient cycling, organic carbon, soil moisture and invertebrate populations will be measured; plant species will be screened for their suitability to be included in cover crop mixes; and the optimum timing and methods to terminate cover crops will be determined.

The project has three components:

1. ***Farm demonstration sites***
   Cover cropping will be examined on 20 farms across south eastern Australia, including four sites on the Eyre Peninsula. On each farm, a replicated demonstration trial will be established from summer late 2018 (dependent on seasonal conditions) and will be monitored until harvest in summer late 2021. Paddocks will be sown with multiple species cover crop (Treatment 1), and will serve as a demonstration paddock. Replicated areas within in the paddock will have two further treatments: Treatment 2 no soil disturbance, no seed added (i.e. business as usual summer fallow) and Treatment 3 single cover crop species sown.
2. ***Cover crop evaluation field trials***
   Two sets of field trials will be conducted. One will evaluate new and emerging summer and winter active plant species/varieties most suited to different environments across south eastern Australia. The other will evaluate the most effective strategies and timings to terminate a cover crop for achieving the optimum benefits for subsequent crops and soil health.
3. ***Extension and communications***
   Extension activities will include field days to be conducted at each of the demonstration sites over the course of the project, and inclusion of updates on project developments at grower group events. Progress on the project will be communicated on SANTFA Twitter, Facebook and Podcast sites, and a dedicated project web site will be hosted by the CSIRO to house project resources as they are produced.

Acknowledgements

The project is being funded with support from the Australian Government, Grains Research & Development Corporation and the South Australian Government.

The project will be delivered in partnership with the SA Murray Darling Basis NRM, Michael Nash, Mallee Sustainable Farming, Ag KI, Southern Farming Systems, Lower Eyre Development Association, Eyre Peninsula Agricultural Research Foundation, Upper North Farming Systems and the MacKillop Farm Management Group.

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