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Farming Systems

Eyre Peninsula Farming Systems 4 - Maintaining profitable farming systems with retained stubble project outcomes

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Farming Systems

Why do the project?

In upper Eyre Peninsula farming systems, retained stubble is essential for livestock feed, to improve water conservation and most importantly to minimise soil erosion risk. Generally, our seeding systems can cope with the relatively low stubble loads produced from cereal, oilseed and pulse crops. However, issues can arise in better growing seasons with increased stubble loads mainly in cereals and associated increases in pests and weeds, with growers resorting to burning and other methods to reduce stubble loads and/or remove pests and weeds.

The GRDC funded project 'Maintaining profitable farming systems with retained stubble - upper Eyre Peninsula EPF00001' aimed to produce locally relevant, sustainable management guidelines to control pests, weeds and diseases while retaining stubble to maintain or improve soil health, and reduce exposure to wind erosion. The major outcome to be achieved was increased knowledge and skills allowing farmers and advisers to improve farm profitability while retaining stubble in farming systems on

upper Eyre Peninsula via a mix of research and validation trials and extension activities.

How did we do it?

The project commenced in July 2013, with trials commencing in the 2014 season. A total of 19 replicated research trials were conducted on three sites across upper Eyre Peninsula; at Minnipa (stubble management, medic pasture two year breaks and herbicide efficacy), Lock (establishment in non-wetting sands) and Mount Cooper (managing pasture and cereal residues for subsequent crops). Paddock monitoring of harvest weed seed collection into windrows and chaff dumps occurred at nine sites from 2014-17, including Wilksch's on lower Eyre Peninsula (2015-16), by collecting paddock samples after harvest and monitoring the germination of weeds in weed seed trays in the following season.

Activities at the sites focused on addressing local barriers to profitability in farming systems with retained stubble. These issues were identified in conjunction with farmers and included grass weeds (mainly barley, brome and annual rye grass), pests (snails and mice), establishment of crops on non-

wetting soils, herbicide efficacy in stubbles, establishment into cereal and medic residues, disease and the use of break crops in rotations. All trial results are published on the EPARF website and GRDC Online Farm Trials database.

Extension activities included presentation of results and useful information at harvest report farmer meetings, field day presentations and 'Sticky Beak' day discussions, e-newsletters to EPARF members, the EP 'Stubble Extravaganza' advisor forum, maintenance of the EPARF website, supporting the publishing of the Eyre Peninsula Farming Systems Summary and the development of 11 locally relevant guidelines and three economic analyses, which have been distributed free as a booklet to all Eyre Peninsula farmers "Guidelines for maintaining profitable farming systems with retained stubble on upper Eyre Peninsula" and are available via the EPARF website www.eparf.com.au/publications.

From 2013-2018, 16 e-newsletters were sent to 300 EPARF members, 1322 growers and advisors attended 53 farmer meetings, 3800 attended 85 field days, 784 attended 17 workshops and 23 technical articles were provided free to 1100 growers, advisors and researchers across southern Australia.

The combined approach was effective in providing growers with information and tools, which increased knowledge and skills to enable them to retain more stubble in their farming systems more often.

The project Steering Committee provided effective and valuable feedback and advice on the project, with 17 project management meetings held during the life of the project by the EPARF Research Review Committee, which is made up of EPARF Board members, MAC research staff and leading upper EP farmers.

What happened?

Changes in knowledge, awareness, skills and attitudes were measured via event evaluation and final project evaluation activities. Practice change was reported by 55% of participants at farmer meetings in 2018, and 67% of participants in the final online survey said they have changed how they managed stubble in the past 5 years. The most common practice changes reported were: adoption of break crops in rotation (often two in a row); cutting stubbles lower; chopping residues; narrow windrow burning; use of chaff carts; sowing on-row in water repellent sands; rolling for snails; changing to disc seeders; and sowing on a slight angle to avoid residue blockages.

84% of advisors surveyed on upper Eyre Peninsula have changed the advice they have given to farmers in relation to retained stubbles in the past 5 years. The highest

single influence was access to new information from locally specific R&D, followed by grower group events and increases in profitability.

Key extension messages were generated as a result of the trials undertaken in the project:

- Overall stubble management and seeding position did not impact strongly on weeds, disease or pests with relatively high stubble loads in a low rainfall farming system at Minnipa.
- Stubble management or seed row position had little effect on grass weed numbers in crop, except in non-wetting sands.
- In several seasons removing or low cut stubble lowered snail numbers compared to high cut stubble.
- Including one or two year break phases in low rainfall paddock rotations can increase profitability over maintaining a continuous wheat cropping sequence.
- Standing stubble cut low (15-17 cm) resulted in the highest level of stubble being maintained into the following season and reduces pest and disease pressure.
- Standing stubble is best for retention of soil cover and herbicide efficacy.
- There were no differences in soil moisture at seeding due to stubble management carried out at the previous harvest.
- Manage cereal stubbles leading into a break phase when establishing small seeded break crops such as canola and sown medic; if pests e.g. mice or snails or weeds are an issue.
- If the break phase is a self-regenerating medic pasture for grazing, harvest the cereal stubble higher.
- Maintain adequate N levels in stubble retained systems.
- For sowing into medic

residues: Cut or smash medic vine in warm, drier conditions; aim for a vine length shorter than the smallest distance between the tine layout. If using Trashcutter to cut medic vine, do twice at 90 degrees. Sow pasture paddocks in warmer, drier conditions to allow better medic vine flow. If using disc seeders operate in dry stubble and firm soil conditions with a sharp cutting edge with thin disc wedge angle. Use high downward pressure capacity on disc units to match requirements for cutting matted residue and an operating depth optimised for the disc size.

- Sow on or near-row in non-wetting sands in dry conditions.
- Barley grass seeds are difficult to capture at harvest (early shedding).
- Rye grass seeds can be captured at harvest.
- Harvest weed seed control - Don't bother with barley grass, rye grass can be done, but harvest low.
- Burning a windrow is better than a whole paddock burn.
- Stubble loads on upper EP, especially in grazed systems, are not high enough to reduce herbicide efficacy.
- Options to increase herbicide activity in paddocks with high stubble loads include increasing chemical and water rates, changing nozzles to increase spray coverage, and reducing the height of the spray boom or stubble height so that herbicides reach the soil surface more easily and cover the soil more evenly.
- Mice: Ensure harvester set up is adequate to reduce grain loss, graze stubbles to reduce grain availability and monitor pest activity in high risk situations. Use Mouse Alert app.

- **Snails:** Reduce stubble height, graze stubbles, roll stubbles. If summer rainfall events occur, bait. Autumn is the most effective baiting period. Windrow burning provides an opportunity for reducing pest numbers as windrows act as an over-summer haven.

The project also provided resources, capacity and flexibility to participate in other events, deliver other outcomes beneficial to growers such as the EP Dry Start Forums, and further

extension activities such as young farmer development and women’s agronomy sessions.

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Photo: EPARF Board members and SARDI Minnipa Agricultural Centre staff at the launch of the ‘Maintaining profitability in retained stubbles’ project

