GRAINS INDUSTRY AND NATURAL RESOURCE MANAGEMENT WORKING TOGETHER

PROJECT UPDATE - JANUARY 2016

Production and environment partnerships is delivering innovative technologies to grain farmers across southern Australia that will increase production and profitability whilst addressing key natural resource issues. Working in partnership with seven natural resource management regions, the project is bringing together the expertise of the grains industry with natural resource networks in these regions to extend the uptake of new and improved farming practices.

PROJECT UPDATE

Four regional projects are being delivered to address issues around integrated weed management and dealing with sandy soils. This newsletter provides a snapshot of the progress to date in each of these projects.

Northern and Yorke: HOLISTIC APPROACH TO WEED MANAGEMENT — ALL WEEDS IN ALL YEARS

Integrated chemical and non-chemical strategies to manage important weed species were the focus of the workshops held with the Laura and Nelshaby Ag Bureaus. Andy Bates of Bates Agricultural Consulting highlighted the importance of early vigour and crop competition, including row spacing and sowing rates as an effective non-chemical tool that should be used in an integrated weed control strategy. Narrow windrow burning, chaff carts and the Harrington seed destructors also provide non-chemical weed control options.

A total of 20 local demonstration paddocks were assessed to evaluate the suitability of automated "spot spray" technology to control weeds. It was found that the spray system was able to detect small weeds, those with blue-coloured leaves such as annual saltbush, jersey cudweed, stemless thistle and had the ability to detect weeds that were not fully controlled with a previous spray.

Spot spray workshop

The detection and targeted application of herbicides represented an average cost saving was 70% across the demonstration paddocks.

The technology

Optical sensing devices detect weeds by measuring the near infrared reflectance (NIR). When combined with solenoids that switch on and off spray nozzles the technology can "spot spray" weeds during the fallow period. This technology improves the control of hard to kill summer weeds, dramatically reduces herbicide use and costs and delivers significant NRM and wider benefits.

Understanding the effects of soil amelioration on weed control

Weed control on light sandy soils can be problematic, and the risk of crop damage and the effectiveness of pre-emergent herbicide application on these soils is highly variable. The Northern Sustainable Soils (NSS) group have established a demonstration site which aims to understand the

effects of a different soil amelioration techniques, including ripping and spading under local conditions. The effectiveness of the soil amelioration practices will be monitored to quantify effects on crop establishment, weed control and production.

Upper and Central Eyre Peninsula: IMPROVING PRODUCTION AND MANAGEMENT ON THE DUNE SWALE SYSTEMS

Adequate crop nutrition and particularly nitrogen supply is fundamental to crop establishment, production and profit margins. Fertiliser is a significant cost and the return on this investment is highly variable, depending on seasonal conditions and soil types. Calculating the benefit-cost of additional fertiliser and measuring the effects across a number of locations, paddocks and seasons is proving to be a valuable source of locally relevant information that can assist growers in making better fertiliser decisions.

Split paddock trials

Split paddock trials have been a valuable tool to help growers to better understand the effects of nitrogen fertiliser product types, rates and timing of nitrogen application on crop establishment, grain yield, quality, and cost benefits or profit margins.

The support and delivery of More Profit from Crop Nutrition workshops across the Upper and Central Eyre Peninsula has provided growers with tools and locally relevant information to assist in making more effective fertiliser decisions. Andy Bates explained to growers how they can measure and calculate nitrogen and phosphorus requirements based upon soil characteristics, previous paddock history, nutrient removal and target yields. Growers were also challenged to review the use and timing of their trace element applications.

Managing non-wetting sands

The focus of this project is on improving crop emergence thereby increasing soil cover and subsequent organic matter into the system. Regional Pilot Project Co-ordinator Linden Masters arranged for a number of local grower groups to learn about local research that is investigating management strategies to improve the productivity of non wetting sandy soils. The addition of a coloured dye provided an effective visual display of how water follows preferential pathways through the soil profile. SARDI and CSIRO researchers are evaluating a number of new soil wetting agents to overcome non-wetting.

Techniques and technologies that were observed included:

- Sandy soils being ameliorated using a delving machine and large discs
- Sand hills being renovated using a mould board plough resulting in exceptional yield increases three years later
- An inspection of in-furrow liquid fertiliser delivery system on a SeedHawk seeder
- Testing and use of new wetting agents
- Evaluating the effect of crop emergence by sowing on row and inter-row

Variable Rate Technology case study

The use of variable rate technology (VRT) enables growers to customise their management by varying crop inputs based upon the productive potential of specific zones within a paddock. As part of the project a case study on Kerran and Mel Glover's property was prepared that describes the rationale, experiences and benefits that they have gained since implementing VRT on their sandy dune – swale farm at Lock.

Victorian and NSW Mallee: INTEGRATED WEED MANAGEMENT (IWM) STRATEGIES TO MANAGE BROME GRASS

Growing Break Crops — A tool for managing Brome Grass

Seventy farmers and agronomists attended two field days facilitated by Mallee Sustainable Farming and

MSF Kyalite Field Day 2015

NSW Local Land Services, Western at Kyalite and Trentham Cliffs in the NSW Mallee region to discuss with specialists the latest research findings. Break crops provide important rotational benefits that can improve the long-term sustainability and profitability of farming systems. A key focus of the field days was on the agronomy and benefits of break crops, including the opportunity to use a range of alternate weed management strategies to control Brome Grass, whilst maintaining groundcover to prevent soil erosion.

Tackling Brome Grass

Understanding how brome grass has adapted to farming practices by emerging later, setting seed earlier and the development of herbicide resistance was a key message of these workshops for growers and their advisors to consider in planning strategies.

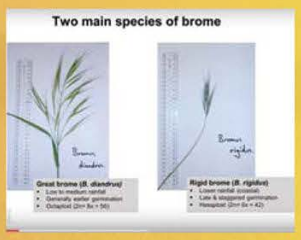
Tanya Morgan Presenting at MSF Ouyen Field Day 2015

The latest research findings and strategies to manage Brome Grass and herbicide resistance in the cropping system were presented by leading research agronomists. An integrated strategy that includes the use of effective chemical and non-chemical tactics that prevent seed set is fundamental.

A range of control tactics including rotation planning, increasing crop competition, crop-topping and/or hay-freezing, weed seed destruction at harvest and narrow windrow burning are needed to keep brome grass at bay for the long term.

Tanja Morgan of Tanja Morgan Project Services and co-author of "The Brome Grass Bulletin" shared the combined knowledge from research and experiences of five South Australian Mallee growers in managing Brome Grass in local farming systems at the MSF Ouyen field day. The SAGIT funded "Brome Grass Bulletin" is available at: http://www.sagit.com.au/brome-grass-bulletin/

Putting brome on the back foot



This video provides a summary of the key messages on brome grass management. A local agronomist also shares an insight into the approach and strategies that he and his growers are using to manage brome grass. The video is available at: https://www.youtube.com/user/MSFMildura

South Australian Mallee: "MAXIMISING THE PRODUCTIVITY AND SUSTAINABILITY OF SANDY SOILS"

The productivity and sustainability of sandy soils is affected by a whole array of inter-dependent factors. These include soil-borne diseases, poor water holding capacity, water seepage, poor nutrient retention, water repellence and compaction. These issues were discussed at the field days held at Karoonda and Loxton with summaries available in the 2014 and 2015 Karoonda Field Day Booklets on the Mallee Sustainable Farming web site: http://msfp.org.au/

Feature articles in "The Drift" newsletter

Articles featuring the latest research findings, tools and resources that are contributing to a better understanding and improvement in the productivity and sustainability of sandy soils in the Mallee have been included in "The Drift", the Natural Resources SA Murray Darling Basin's weekly e-newsletter http://msfp.org.au/.

MSF Loxton Field Day 2015

Research Compendium

The aim of this compendium is to provide agricultural and environmental communities the South Australia Murray Darling Basin (SAMDB) with an up to date source of current and recent past projects that address the issues for optimising the productivity and sustainability of sandy soils. This compendium will be an important source of information, contacts and additional resources available to better understand and manage a range of issues that affect the productivity and sustainability of sandy soils.

Feature articles have included findings from the New Horizons and other soil amelioration trials, using the Yield Prophet decision-support tool, crop sequencing, frost and narrow windrow burning.

This makes use of a communication channel that brings together natural resources management and production agriculture issues and represents a growing collaboration between grains extension and Natural Resources Murray Darling Basin networks.

Explaining Yield Prophet

Yield Prophet is an on-line crop production model designed to present grain growers with real-time information about the growth and yield potential of their crops. Yield Prophet generates crop simulations and reports to assist in decision making by matching crop inputs with potential yield in a given season.

The simulations provide a framework for farmers and advisors to:

- Forecast yield
- Manage climate and soil water risk
- Make informed decisions about nitrogen applications
- Match inputs with the yield potential of their crop
- Assess the effect of changed sowing dates or varieties
- Assess the possible effects of climate change

The Production and Environmental Partnerships project has supported the explanation of Yield Prophet reports from research sites at Pata and Karoonda. The Karoonda site focussing on the differences between the bottom, mid slope and top of a Mallee dune feature.
https://www.facebook.com/MalleeSustainableFarming

For further information on each of the regional projects contact:

Northern & Yorke	Holistic approach and program to weed management, all weeds in all years.	
Contact - Matt McCallum	0438 895 167	matthewmcag@bigpond.com
Upper & Central Eyre Peninsula	Improving production and management on the dune swale systems	
Contact - Linden Masters	0401 122 172	lindenmasters5@gmail.com
Mallee - South Australian & southern Victorian Mallee	Maximising the productivity of sandy soils	
Contact – Stuart Putland	0427 219 103	stuart.putland@msfp.org.au www.msfp.org.au P.O. Box 843, Irymple 3498
Mallee - northern Victorian & New South Wales Mallee	Integrated Weed Management (IWM) strategies that embrace robust rotations (including break crop s, pastures and fallow) to manage Brome Grass.	
Contact – Stuart Putland	(as above)	

To find out more about the project or to get involved contact:
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