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Deep ripping

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TITLE: Deep ripping
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Ron Jarvis and Leigh Smith

88Ba11, 12 Deep ripping at two depths in lupin/oat/wheat rotation on newish land

Sited on the new block of Badgingarra Research Station, these trials aim at examining the response to new rippings each cereal year as well as the response over time to the residual effect of ripping. The rotation is the normal one applied on the Research Station.

88Ba11 (oats '88) is in block 29 which was first cropped to lupins in 1984 after the clearing operations (blade plough, double chain, heavy rake in April 84) and two combine topdressings of P.

In 1985 it was raked and oats direct drilled.

1986 fireharrowed and wheat direct drilled, and potash topdressed in July.

1987 lupins direct drilled and potash topdressed.

88Ba12 (wheat '88) in block 22 had the clearing operations as above in May '84.

1985 disc ploughed and raked, TD twice with P, sown to wheat, TD with N in July.

1986 lupins sown, TD potash July, lupin stubble raked and windrows burnt.

1987 scarified lightly and oats sown. Topdressed 10 D.A.S. and with urea and potash in July, and Ally sprayed July.

Although the sites are relatively newland, there has been more compaction than similar history farmer paddocks because of the Plant Breeder requirements of a fast build up of soil P by topdressing.

Soil type is a light yellow coarse sand with little clay. Penetrometer measurements on July 21 showed a similar pattern of compaction at both sites.

The very broad compaction layer had maximum strength at around 25 cm depth.

In 1988 oats responded to the deepest ripping by nearly 600 kg/ha, and wheat by 330 kg/ha.

In 1989 A near significant lupin response to ripping during the wheat year. Response to residual of ripping and to new ripping by wheat, although only 200 kg/ha.

| Date | Operation |
|--|---|
| <u>88Ba11 Oats 1988, wheat 1989, Lupins 1990</u> | |
| 2/5/90 | Stubble was fire harrowed. |
| 3/5 | 1.2 L/ha Roundup and 2.0 L/ha simazine. |
| 8/5 | 100 kg/ha potash topdressed. |
| 22/5 | 100 kg/ha Gungurru (without Rovral) and 200 kg/ha super sown. |

| Date | Operation |
|--|---|
| <u>88Ba12 Wheat 1988, lupins 1989, oats 1990</u> | |
| 24/5/90 | 2.0 L/ha Spray.Seed. |
| 1/6 | Site harrow burnt. |
| 12/6 | 2.0 L/ha Spray.Seed. |
| 19/6 | Cultivated parallel to plots, then 1990 rip treatments. |
| 20/6 | Sown with 50 kg/ha Winjardie oats and 130 kg/ha super. |
| 25/7 | 100 kg/ha urea topdressed down each plot. |

| Treatment | Grain yield (kg/ha) | |
|-------------------|---------------------|---------------|
| | 8Ba11 (lupins) | 88Ba12 (oats) |
| Direct drill | 2321 | 1639 |
| Ripped 20 cm 1988 | 2308 | 1720 |
| Ripped 35 cm 1988 | 2359 | 1691 |
| Ripped 20 cm 1989 | 2353 | |
| Ripped 35 cm 1989 | 2318 | |
| Ripped 20 cm 1990 | | 1595 |
| Ripped 35 cm 1990 | | 1612 |
| Significance | n.s. | 0.008 |
| 5% LSD | | 61 |

Lupins did not respond to previous years' deep rippings. Oat establishment problems and topdressing difficulties on this years ripping treatments biased against a response. There was a slight yield response to the 1988 ripping.

89K01 Deep ripping for barley and lupins - Kojaneerup Block of MBKS

Deep white sand over clay.

| Date | Operation |
|------------|---|
| 20/10/1988 | Ripping operations in pasture with Agrowplow for the 1989 barley. |
| 1990 | Sown across with lupins. |

Penetrometer measurements on 3/7/89. There was no compaction pan but the soil increased in strength to 3 MPa at 40 cm depth and remained at that strength to the penetrometer's maximum depth of 52 cm.

| 1988 rip Treatment depth (cm) | 1990 Lupin yield (kg/ha) | |
|-------------------------------------|--------------------------|-------------------|
| | Direct drill 1989 | Scarified 1989 |
| Nil | 1654 | 1586 |
| 7 | 1537 | 1537 |
| 20 | 1495 | 1452 |
| 28 | 1457 | 1574 |
| 35 | 1307 | 1527 |
| Average | 1490 | 1535 |

1989 Barley

Main treatments significant ($p = 0.01$) 5% LSD = 416 kg/ha. Scarifying nearly significant ($p = 0.09$) with 224 kg/ha or 10% advantage. The lack of response to scarifying in the unripped Tr 1 may have been due to lack of penetration.

1990 Lupins

Yields not significantly different by A.O.V., however lupin yield declined as the previous year's barley yield increased due to ripping, but only where the barley had been direct drilled. This was a significant trend at $p < 0.05$ with lupin yield declining by 40 kg/ha for every 100 kg/ha yield increase of barley.

82WH49 Deep Ripping in a 2 wheat/2 pasture rotation

This trial was in its second year of pasture in 1990 and will be cropped to wheat in 1991 to compare the residual value of rippings in previous years, with ripping and cultivation in 1991.

85WH62 Depth of ripping by shank spacing - Wongan loamy sand

Rip treatments were carried out in pasture in August 1985. Cropped to wheat 1986, 1987, 1990. Pasture in 1988 and 1989.

The average response to ripping was 1100 kg/ha in 1986 with a response, due to the residual effect, of 400 kg/ha in 1987.

In 1990 the site was cultivated and then sown a week later, on June 1, with Reeves wheat with 53 kg/ha DAP. 30 kg/ha urea was topdressed on July 31.

The average yields were:

- direct drill (86 and 87) 3346 kg/ha
- scarified (86 and 87) 3206 kg/ha
- deep ripped (85) 3527

There was only a small residual effect of ripping on wheat yield.