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Fallow re-assessment (Merredin Research Station)

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DEPARTMENT OF AGRICULTURE

Western Australia



SUMMARY OF RESULTS 1977

FALLOW RE-ASSESSMENT

D. Tennant
Research Officer
Plant Research Division

FALLOW RE-ASSESSMENT - 72 M 29

Location Merredin Research Station

Treatments

1. Long Fallow - maximum moisture storage treatment. Cultivated at first rains in establishment year and subsequently when necessary for weed control.
2. Mechanical Fallow - cultivated early July in establishment year after completion of seeding operations and then cultivated when necessary for weed control.
3. Chemical Fallow - sprayed with weedicide to kill pasture before seed set in the establishment year.
4. Short Fallow - left in pasture during establishment year and cultivated after summer rains, if any.
5. Pasture-Crop - left in pasture during establishment year and cropped in assessment year.
6. Continuous Crop - minimum moisture storage treatment. Cropped in establishment and assessment years.

Crop: Gamenya wheat.

Results:

1. Yields (Table 1) were significantly highest with long fallow.
2. Yields were higher with mechanical and chemical fallow than the pasture crop treatment and lowest with continuous cropping.
3. There was a slight benefit from mechanical than chemical fallowing.
4. Stored soil water at planting was of the order of 67 mm with long fallow, 57 mm with mechanical fallow, 49 mm with chemical fallow and 46 mm with the pasture-crop and continuous crop treatments.
5. These and similar relative differences in stored soil water at planting as obtained in all years other than 1974 were analysed relative to yields. Yields were shown to be significantly related to stored soil water at planting. co-efficients of determination ranged from 0.87 to 0.97. High growing season rainfall in 1974 nullified differences in stored soil water which had developed over the 1973 treatment establishment year.
6. Yield increases obtained from every additional 10 mm of stored soil water at planting ranged from 100 kgha⁻¹ to 162 kgha⁻¹. The 1977 regression data gave a yield increase of 155 kgha⁻¹/10mm of stored soil water.

TABLE 1

Growing Season rainfall and yields at Merredin

Treatments*	Yields kg ha^{-1}					
	1972+	1973	1974	1975	1976	1977
<u>Establishment</u> <u>Year</u>						
Continuous crop	662	1398	3398	516	387	533
<u>Assessment</u> <u>Year</u>						
Continuous crop	-	1056	3445	590	533	243
Pasture crop	-	1547	3867	637	506	323
Chemical fallow	-	1445	3511	1063	740	407
Mechanical fallow	-	1570	3433	1410	730	439
Long fallow	-	1792	3167	1540	1043	647
Growing season rainfall	174mm	270mm	317mm	245mm	167mm	153mm

+ Trial established 1972

* Short fallow treatment not effective throughout.