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Comparison of organic and conventional farming systems with particular reference to soil fertility

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Introduction

Organic farmers in Europe and North America often achieve comparable returns to conventional farmers. In contrast with soils of Europe and North America, to those in southern Australia are often highly weathered and have very low nutrient reserves. The present study was conducted to quantify wheat production levels in organic and conventionally grown wheat fields in south-west Australia, and to relate these to soil nutrient status.

Materials and methods

Six registered organic farms in the wheatbelt of south-west Australia were selected. Sites paired with a nearby wheat crop on the same soil type and with similar cultivation history and similar management. Four 20 X 20 m plots selected for measurement of soil properties and wheat production in the 1992 and 1993 season.

Results and Discussion

Seed yields varied from 1.2 to 2.6 t/ha in organic plots (Table 1). Yields in conventional plots were higher at only sites 4 and 5; but comparable at sites 1, 3 and 6. Grain protein were unaffected by the system but did differ among the sites (Table 1). Grain P content largely reflected yield, the organic crops removing 5-10 kg/ha/crop which is currently not replaced (Table 1).

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Table 1 Grain and stubble, grain N and P in paired organic and conventionally farmed sites. Oat were sown .Values are means of 4 replicate(standard error)

Sites	Production systems	Grain yield(kg/ha)	Stubble dry matter (kg/ha)	Grain N (%)	Grain P (kg/ha)
1	Organic	2613(127)	3616 (253)	1.8 (0.1)	10.4(0.5)
1	Conventional	2664 (55)	3216 (231)	1.9 (0.1)	8.0 (0.2)
2*	Organic	1743 (644)	1469 (147)	1.2 (0.1)	4.6 (1.3)
2	Conventional	296 (50)	708 (150)	2.0 (0.2)	0.6 (0.2)
3	Organic	2427 (157)	3405 (224)	1.9 (0.1)	9.5 (1.2)
3	Conventional	2023 (289)	2997 (369)	1.9 (0.1)	6.2(1.9)
4	Organic	1790 (109)	3178 (281)	1.3 (0.1)	5.9 (0.5)
4	Conventional	5038 (282)	9307 (475)	1.3 (0.1)	16.2(1.4)