

The effect of controlling sorghum with glyphosate on tillage practices and soil water status

G.R. Monro

Monsanto Australia Limited, P.O.Box 72, Toowoomba Q1d.4350

Glyphosate (Roundup? herbicide) is applied to control grain sorghum (*Sorghum bicolor*) pre-harvest, or post-harvest where regrowth occurs in standing stubble or emerges after slashing (1). Trials were carried out during 1984 at two locations on the Darling Downs to examine the effect of controlling grain sorghum with glyphosate on tillage practices and soil water status.

Methods

At Jondaryan sorghum ground was intended for recropping to sorghum (7 month fallow). Soil water content was determined when a high level of control of sorghum was achieved in both sprayed and mechanically tilled plots. At Dalby sorghum ground was intended for double cropping to barley (2 month fallow). Soil water content was determined as soon as sowing was possible in both sprayed and mechanically tilled plots. Sorghum regrowth which emerged after slashing was sprayed or mechanically tilled at both sites. A pre-harvest treatment was included at Jondaryan. For the mechanical tillage treatment normal district practices were used. Core samples (5 per rep., 3 reps.) were taken using a 0.038 m by 1.2m cylindrical probe.

Results and discussion

Table 1. Effect of controlling sorghum with glyphosate on tillage practices.

SITE	ROTATION	SPRAYED SORGHUM		MECH. TILL. sorghum
		Pre-harv.	Post-harv.	
Jondaryan	s - s	0.54g ha ⁻¹ glyphosate	0.45g ha ⁻¹ glyphosate	scarifier
		-	-	scarifier
Dalby	s - b	0.45g ha ⁻¹ glyphosate	-	disc plough
		-	-	chisel plough

Table 2. Effect of controlling sorghum with glyphosate on soil water status (mean total water,an).

Site Rotation Operation	Jondaryan s - s			Dalby s - b	
	SPRAYED SORGHUM Pre-harv.	SPRAYED SORGHUM Post-harv.	MECH.TILL sorghum	SPRAYED SORG. sorghum	MECH.TILL sorghum
Depth (cm)					
0-10	3.662	3.707	3.585	3.384	2.636
10-30	10.455	9.767	9.573	11.789	10.713
30-60	15.653	15.222	14.201	14.474	14.016
60-90	15.154	14.085	13.547	15.531	15.142
90-120	15.010	13.333	13.740	13.860	12.920
Total	59.934	56.114	54.646	58.038	55.427

Effective control of grain sorghum and ground preparation for sowing were achieved in one operation with the use of glyphosate (Table 1). In contrast, two mechanical tillage operations were required to achieve these objectives. The lower number of tillage operations required resulted in reduced time, fuel, labour and machinery inputs and improved stubble retention for protection against water erosion. Total soil water content was highest in sprayed plots at both sites (Table 2). Pre-harvest treatment gave a further improvement in total soil water content at Jondaryan. Post-harvest treatment with glyphosate resulted in a higher soil water content in the 0-10cm layer at Dalby. This improved crop establishment.

1. Monro, G.R. 1984 Proc. Seventh Aust. Weeds Conf., Perth, (in press).

