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W. J. Toms

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Gairdner River. Experiment 1, 1958. The plot at left received no sulphate of ammonia. That on the right received 112 lb./ac. Note the denser stand. The grain yields were 29 bush./ac. and 45 bush./ac. respectively.

THE USE OF NITROGEN FERTILISERS FOR CEREALS IN THE JERRAMONGUP—GAIRDNER RIVER DISTRICTS OF WESTERN AUSTRALIA

By W. J. TOMS, B.Sc. (Agric.), Research Officer, Plant Research Division

HIGH yields of oats have been obtained with nitrogen fertilisers on newly-developed scrub plain areas of the south coastal districts. This suggests that excellent crops can be expected here after the land has grown subterranean clover for a number of years. The use of nitrogen fertiliser on new land, in addition to super, copper and zinc has resulted in production of a much better straw for burning to control suckers and poison plants. Sulphate of ammonia at 56 lb. per acre, is a suitable application.

To the west of the Esperance Plain and contained roughly by the coast and a line drawn from Albany to Newdegate, thence to Hopetoun lies a largely undeveloped area with a potential as great as the Esperance Plain.

The War Service Land Settlement organisation has taken up some 400,000 acres in the middle of this area at Gairdner River, Jerramongup and Corackerup. Two hundred thousand acres of these holdings are now sown to subterranean clover and Wimmera ryegrass.

EXPERIMENTAL RESULTS

Cereal crops grown on experimental plots on new land at Jerramongup in 1956 gave low yields in spite of application of adequate superphosphate and the trace elements copper and zinc. It seemed that the area might, in this respect, resemble

the Esperance Plain where satisfactory crops on new land were not often obtained. However, the use of sulphate of ammonia gave good yield increases in 1956 (see Table 1) and also produced a much better straw for firing to control suckers and poison.

Further experiments planted at Gairdner River in 1957 (see Table 2) and in 1958 (see Table 3) showed that excellent crops can be grown on new land in this area, particularly when a nitrogen fertiliser is used.

Experiment 2, 1958, was situated on a sandy soil near the Bremer Bay Road in the southern part of the Gairdner River W.S.L.S. project. This soil is representative of quite large areas of the country nearer the coast. It is considered generally inferior to the soils found further north through the Gairdner project to Jerramongup.

Yields of Wheat and Oats with Sulphate of Ammonia at Jerramongup, 1956

	Without Sulphate of Ammonia	With 56 lb./acre Sulphate of Ammonia
Wheat Yield (bush./ac.)	10	16
Oat Yield (bush./ac.)	18	30

Oat Yield Responses to Nitrogen Fertiliser at Gairdner River, 1957

Nitrogen Fertiliser Treatments	Expt. 1	Expt. 2	Expt. 3
No Nitrogen Fertiliser	37	31	39
*Urea equal to 28 lb./ac. of Sulphate of Ammonia	41
*Urea equal to 56 lb./ac. of Sulphate of Ammonia	42	40	39
56 lb./ac. of Sulphate of Ammonia	38	41

TABLE 3

Responses of Oats to Sulphate of Ammonia at Gairdner River, 1958

Nitrogen Fertiliser Treatments	Experiment 1 (Gravelly Loamy Sand over Clay at variable depths, 3 to 18 inches)	Experiment 2 (Fine White Sand over Gravel at 6 to 12 inches)
No Nitrogen Fertiliser	29.2	25.2
28 lb./ac. Sulphate of Ammonia	31.4	26.6
56 " " " "	44.5	28.2
112 " " " "	45.4	32.0
224 " " " "	42.1	40.4

EFFECT OF EARLY GROWTH

In both the 1958 experiments all rates of sulphate of ammonia **reduced** early plant growth. This has occurred repeatedly on other experiments. However final yields are usually increased by using sulphate of ammonia.

In 1956 at Bremer Bay, sulphate of ammonia up to 168 lb./ac. was drilled with the oat seed, and in one treatment sulphate of ammonia at 168 lb./ac. was broadcast prior to drilling the seed. Early in the season the poorest plots were those receiving 168 lb./ac. drilled, while 168 lb./ac. broadcast gave the best growth. At

the end of the season these two treatments gave the same yield, both being better than lower rates of sulphate of ammonia. It is considered that no permanent damage to the crop is likely by drilling sulphate of ammonia at 56 lb./ac. with the seed.

RATE OF FERTILISER TO USE

Sulphate of ammonia will not take the place of superphosphate. On new land it should be used in conjunction with a bag (187 lb.) of copper-zinc-super/acre.

Thus if sulphate of ammonia at 56 lb./ac. is to be applied, a total of about 240 lb./ac. of copper-zinc-sulphate of ammonia-super mixture would have to be drilled. This rate would supply super at 150 lb./ac.

DOES IT PAY?

Experience in other districts has shown that the response to sulphate of ammonia depends largely on the season. In a dry year or if the spring weather is too dry little increase in yield may be obtained. It is for this reason, and because of the appreciable monetary outlay involved, that sulphate of ammonia has not been generally recommended for new light land. In the southern districts where the chances of dry spring weather are least, the chances of benefits from sulphate of ammonia are considered good. In 1957, finishing rains were very poor (108 points for September and October) whereas in 1958 finishing rains were very good (473 points for September and October). This is reflected in the comparatively low yield responses to nitrogen obtained in 1957.

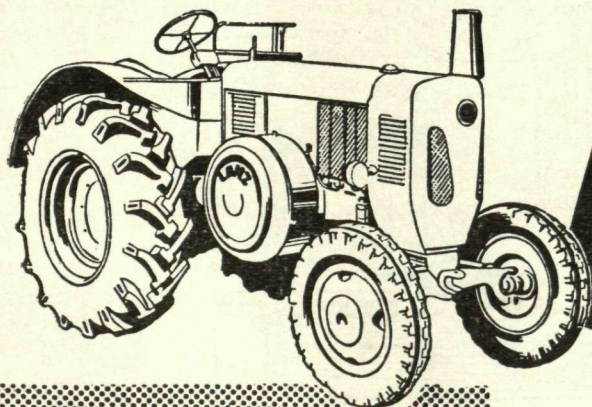
Fifty-six pounds of sulphate of ammonia costs approximately £1. Farmers of limited capital may obtain a better monetary return by spending this money on superphosphate for their new land, or on fencing, or on equipment, but when sucker and poison growth must be controlled by a stubble fire, the use of sulphate of ammonia at about 56 lb./ac. is recommended.

When crops are taken in two successive years on new light land in order to obtain two burns, sulphate of ammonia is even more necessary for the second crop.

Acknowledgment.

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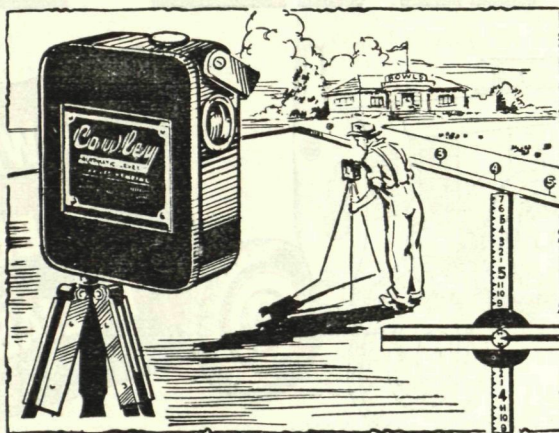
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