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A COMPARISON OF METHODS OF UREA APPLICATION AT AJANA

by: M. G. Mason, R. J. Parkin and H. Patrick

Compared with urea application separate from the seed, urea mixed with wheat seed delayed and reduced wheat germination, and reduced wheat yields, especially at high rates of urea. Yields were higher where the urea was top-dressed immediately before seeding than where it was top-dressed either immediately after, or two weeks after seeding.

Previous research has indicated that, in areas with less than 18 in. annual rainfall, urea should be applied as close to seeding as possible. Mixing urea with seed in the seed box appeared a practical way of applying urea at seeding, and this trial examined the effect of mixing urea with the seed, and compared cereal yields resulting from urea applications made immediately before, immediately after, and two weeks after seeding.

The trial was carried out in 1967 on new land at Ajana, on a yellow sand with loam increasing at depth. Original vegetation was native pine and grevillea with occasional mallee. Rainfall in 1967 was 1,246 points (annual average about 12 in.) and daily rainfall during seeding is shown in Figure 1. The trial was sown on May 25 and its results are summarised in Figure 2.

Discussion

Yield effects

All three methods of application gave very profitable yield responses to urea but the most profitable treatment was 100 lb. per acre applied at seeding. Where the application was made two weeks late the most profitable rate was 150 lb. per acre but was still not as profitable as 100 lb. per acre applied at seeding. The 100 lb. rate is well above that normally recommended for this situation—40-45 lb./acre based on results from many trials in similar situations.

Lower yields resulting when urea was applied after seeding may be due to loss of nitrogen from urea to the atmosphere. Such losses would be minimised if the urea was covered by a little soil after application, or if rain after application washed the urea into the soil. Figure 1 indicates that in this trial there was insufficient rain to wash the urea into the soil following either after-seeding application.

Urea mixed with the seed

Urea mixed with the seed delayed germination; a result favoured by seeding into moist soil with only light following rain. The drilled urea forms a concentrated band with the seed and, with only a small amount of moisture, forms a highly concentrated salt solution close to the seed. Germ-
inination is delayed until further moisture causes the solution to become less concentrated.

At rates of 75 lb. per acre and higher, urea mixed with the seed reduced plant numbers and gave lower yields than other methods of urea application. The reduction in germination is due to the release of free ammonia near the seed.

**Conclusion**

For lower rainfall areas it is recommended that urea be applied as close to seeding as possible. To avoid losses of nitrogen to the atmosphere, applications should be made just before seeding by:

- using an extra fertiliser box which drops urea in front of the seeding tynes, or
- towing an extra combine or drill in front of the seeding machine.

**Acknowledgments**

Thanks are extended to Mr. W. Boetcher who made the land available for this trial, and to field assistants G. Boylan, R. Jones and P. Lockwood who assisted in planting the trial.

**SENIOR IRRIGATION OFFICER RETIRES**

Officer-in-Charge of the Department of Agriculture’s Irrigation Branch, Mr. George Gauntlett, has retired after 42 years’ service with the Department.

He was one of the Department’s longest-serving scientific advisers, having joined as a cadet in 1922.

From Perth Modern School he went to the W.A. University when it was in Irwin Street and after graduating B.Sc. (Agric.) he was appointed an agricultural adviser, serving first with the Dairy Branch.

He was transferred to the Irrigation Branch and stationed at Harvey, where he became very closely associated with every aspect of irrigation farming in the district.

In the 1930’s he was associated with fertiliser and pasture variety trials which formed the basis of present knowledge for successful irrigation farming in the area. He saw the irrigation area expand to the present state where 30,000 acres are watered.

With the previous Officer-in-Charge of the Branch, Mr. H. K. Gibsone, he popularised the use of modern earthmoving equipment for grading irrigated land, a practice which improves water distribution and the productivity of the soil.

Mr. Gauntlett was transferred to Perth in 1956 and became Officer-in-Charge of the Branch on the retirement of Mr. Gibsone in 1967. In this position, Mr. Gauntlett’s duties included advising on private irrigation schemes.
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