

## Susceptibility of grain sorghum cultivars to 3,4-d and picloram plus 3,4-D

W.H. Hazard and S.J. Bath

Research Station, Department of Primary Industries, Biloela, Q. 4715.

The herbicides 3,4-D and picloram plus 3,4-D (Tordon 50-D) have been widely used in Queensland for the control of broadleaf weeds in grain sorghum. Current recommendations are based on research work carried out 10 to 30 years ago, mainly on open pollinated cultivars. The range of commercially available grain sorghum cultivars has changed considerably since that time.

Recent research and field experience indicated that some sorghum cultivars were adversely affected by both herbicides when applied at current recommendations (Rawson et al. 1978). Three experiments were conducted over three years at the Biloela Research Station in Central Queensland to examine the susceptibility of 10 grain sorghum cultivars to currently recommended rates and times of application of 3,4-D amine and Tordon 50-D. (Table I).

**TABLE I. Effect of 3,4-D amine, and Tordon 50-D on the yield (kg ha<sup>-1</sup>) of grain sorghum cultivars (combined analysis over 3 years).**

| Cultivars        | 2,4-D amine<br>0.5 kg a.e. ha <sup>-1</sup> | Tordon 50-D<br>1.4 L product ha <sup>-1</sup> | Untreated<br>Control |
|------------------|---|---|----------------------|
| Alpha            | 3314  | 3175  | 3265                 |
| DeKalb E57       | 4225  | 4322  | 4716                 |
| Q5161            | 3967  | 3917  | 4088                 |
| Yates NK 233     | 3842  | 4030  | 4252                 |
| DeKalb C42T      | 3627  | 3665  | 4153                 |
| Pacific Goldrush | 3659  | 3696  | 4585                 |
| Texas 610SR      | 3841  | 3902  | 3939                 |
| Pioneer 846      | 4245  | 4086  | 4279                 |
| Yates NK 266     | 4197  | 4278  | 4577                 |
| Asgrow Dorado E  | 4097  | 4099  | 4610                 |

LSD (P = 0.05) = 306; (P = 0.01) = 404

Yield reductions (P < 0.05) were caused by reductions in panicles per plant and grains per panicle. Yield reductions (P < 0.05) were not obtained in one of the three years, which underlines the importance of conducting herbicide susceptibility work in more than one year. There were only three cultivars (Alpha, Texas 610 SR and Pioneer 846) which did not show a yield reduction (P < 0.05) to either herbicide in any of the three years. There was a significant (P < 0.05) year x herbicide x cultivar interaction which makes it difficult to predict the level of yield loss that can be expected from a cultivar in a particular year.

The conclusions drawn from the experiments are (a) yield losses of up to 40% for 3,4-D and 35% for Tordon 50-D were obtained when the herbicides were applied according to current label directions and (b) there is a need to examine the herbicide susceptibilities of new cultivars of grain sorghum and other crops and understand how those susceptibilities are influenced by the environment.

Rawson, J.E., Marley, J.M.T. and WALSH, S.R. (1978). *Qd agric. J.* 104: 578.