

ANNUAL WEED CONTROL IN TRIAZINE TOLERANT RAPESEED

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Abstract. Atrazine, cyanazine and metribuzin were applied pre-plant incorporated, preemergence and early postemergence to triazine tolerant rapeseed to determine their safety to the crop and efficacy in controlling Brassica spp. and other annual weeds. Trials were conducted in Ontario, Canada, a relatively cool and moist rapeseed growing region. Atrazine exhibited excellent crop safety and provided the best weed control when applied at 0.5 - 0.75 kg/ha (plus oil) early postemergence. Low rates of soil applied atrazine were associated with an apparent increase in seed yield relative to weed-free treatments. Cyanazine, with and without oil, provided excellent crop safety and the best weed control was associated with the 1.5 kg/ha (plus oil) early postemergence treatment. Several rates of soil and postemergence applications of cyanazine were also associated with apparent seed yield increases. Crop injury was observed with metribuzin treatments of 0.5 kg/ha or greater. Preemergence applied metribuzin at 0.375 kg/ha was the best treatment but still requires an additional herbicide treatment in combination for complete annual weed control.

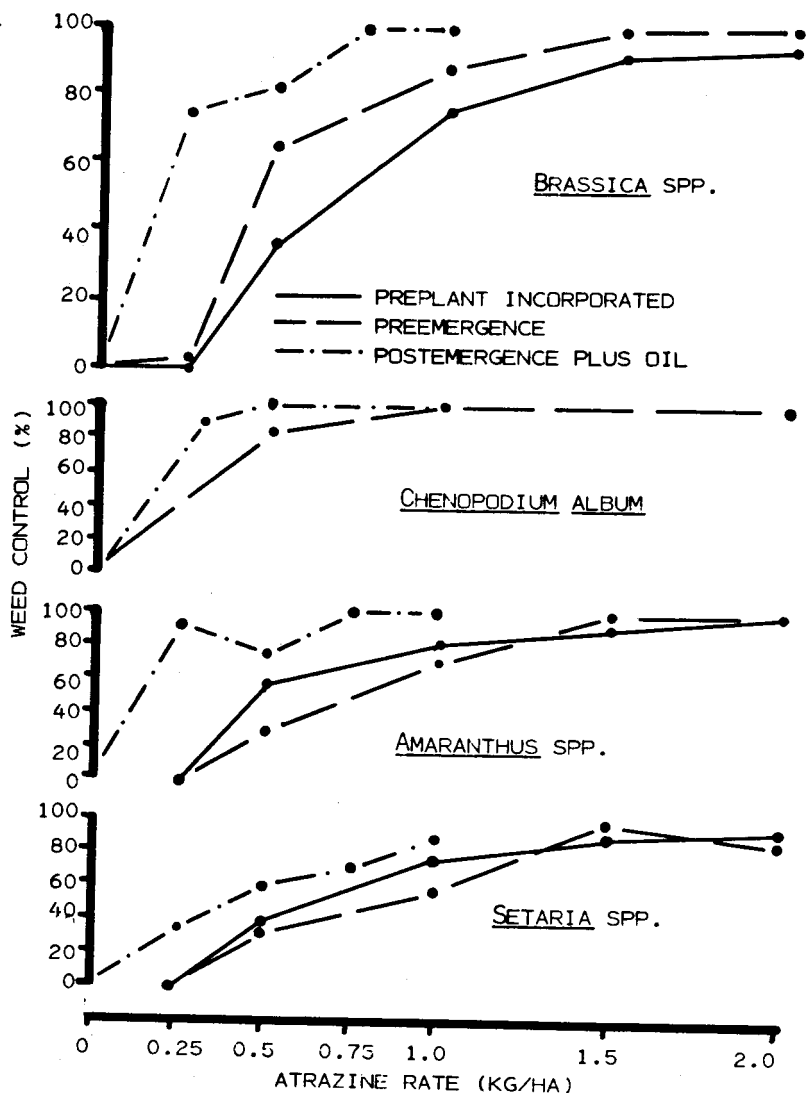
Introduction. With the recent research incorporating triazine tolerance into rapeseed (Brassica napus) (1) the potential exists to control several wild mustard (Brassica spp.) weeds in this important crop. A research program was initiated in Ontario in 1981 to determine the effect of several triazine herbicides on triazine tolerant rapeseed, wild mustard, and several other annual weeds.

Materials and methods. Experiments were conducted at the Elora Research Station, Ontario, Canada (rainfall: 1981, 85 cm.; 1982, 105 cm) (corn heat units: 1981, 2797; 1982, 2916). The experimental details are as reported previously (2,3,4).

Results: Atrazine. In general early postemergence (2-4 leaf rapeseed) treatments were more effective than preemergence ones; which, in turn, were more effective than preplant incorporated treatments (Figure 1). The best treatments were 0.5 - 0.75 kg/ha atrazine plus oil. Some grassy weeds were missed with this application. Early crop injury was less than 6% with atrazine rates from 0.25 - 2.0 kg/ha with all application timings. No injury symptoms were observed later in the season and no seed yield losses occurred. Apparent seed yield increases were observed from several low rate, soil applied, treatments (figure 2). Further research is indicated to confirm this early field work. Theoretically this phenomenon could be related to previous mechanisms first elucidated by Ries and coworkers (6,7), and others (5).

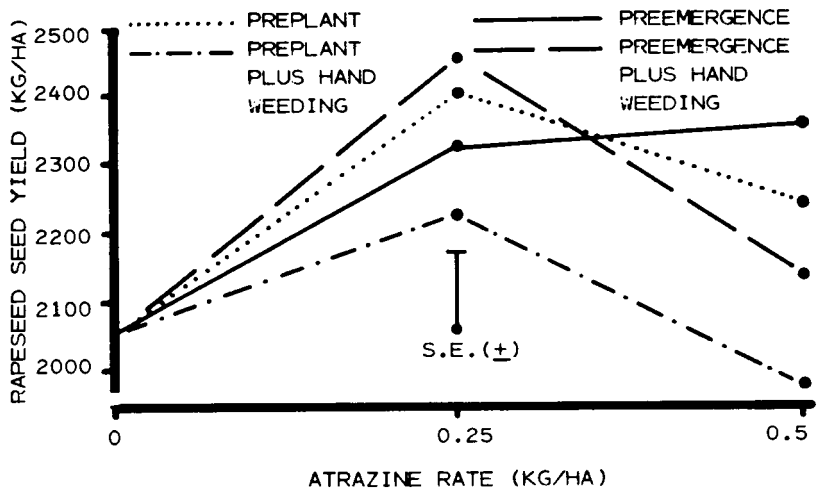
Cyanazine. As with atrazine, the early postemergence treatments, especially with the addition of oil, were more effective

Figure 1. Effect of atrazine on several annual weeds when applied to the soil and foliage.



than the soil applied treatments (Figure 4). Further research is indicated for postemergence treatments at rates less than 1.5 kg/ha plus oil. Early crop injury was less than 7% with cyanazine rates from 0.375 to 4.0 kg/ha with all application timings except the early postemergence treatment at 3.0 kg/ha plus oil which had 12% early crop injury. No crop injury symptoms were observed

Figure 2. Effect of low atrazine soil applications on rapeseed seed yield in 1982, with and without hand-weeding.



later in the season and no losses in crop yield from cyanazine were observed (Figure 3). Those treatments in which yield losses did occur most probably were due to poor weed control and weed interference. As with atrazine, apparent yield increases occurred with several treatments.

Metribuzin. Some difficulty exists in determining effective rates and timing for metribuzin while providing for crop safety (Figure 3). Effect of cyanazine on rapeseed seed yield (expressed as a % of the weed-free control).

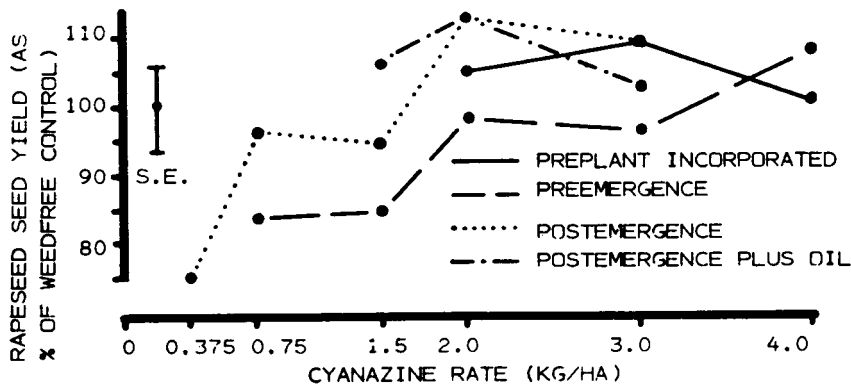
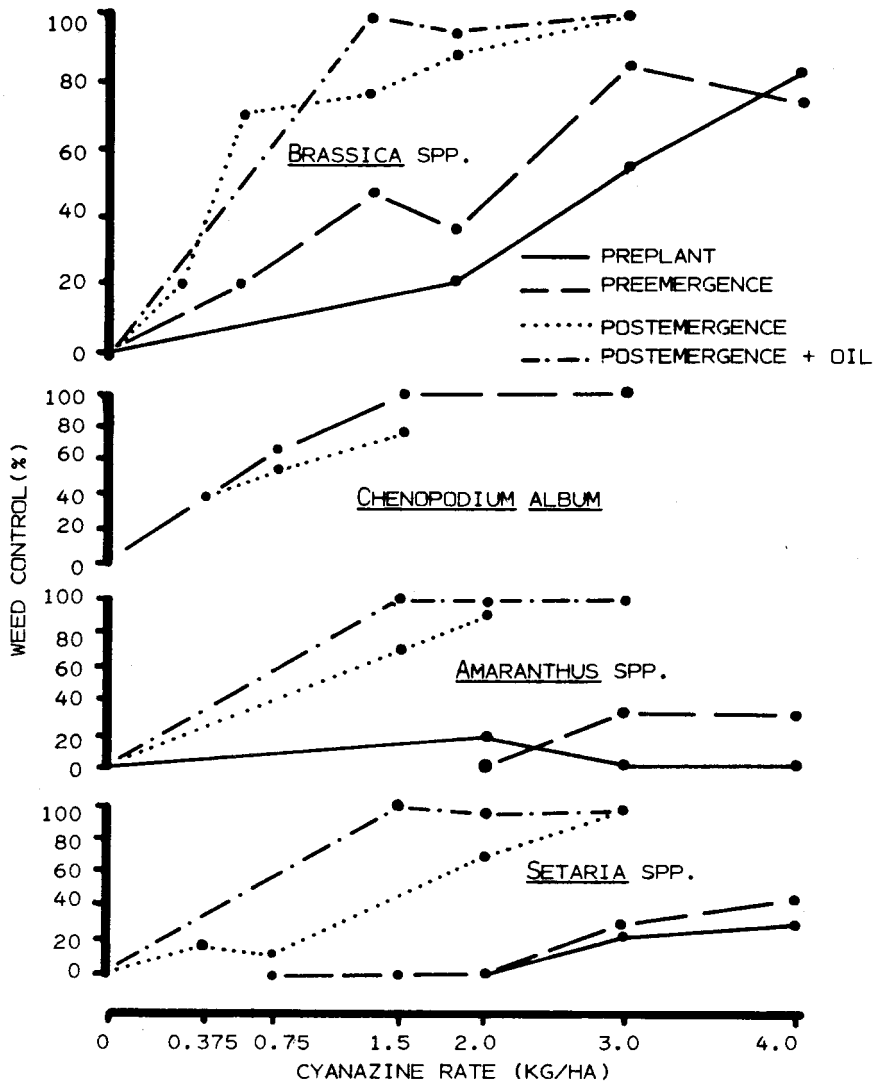


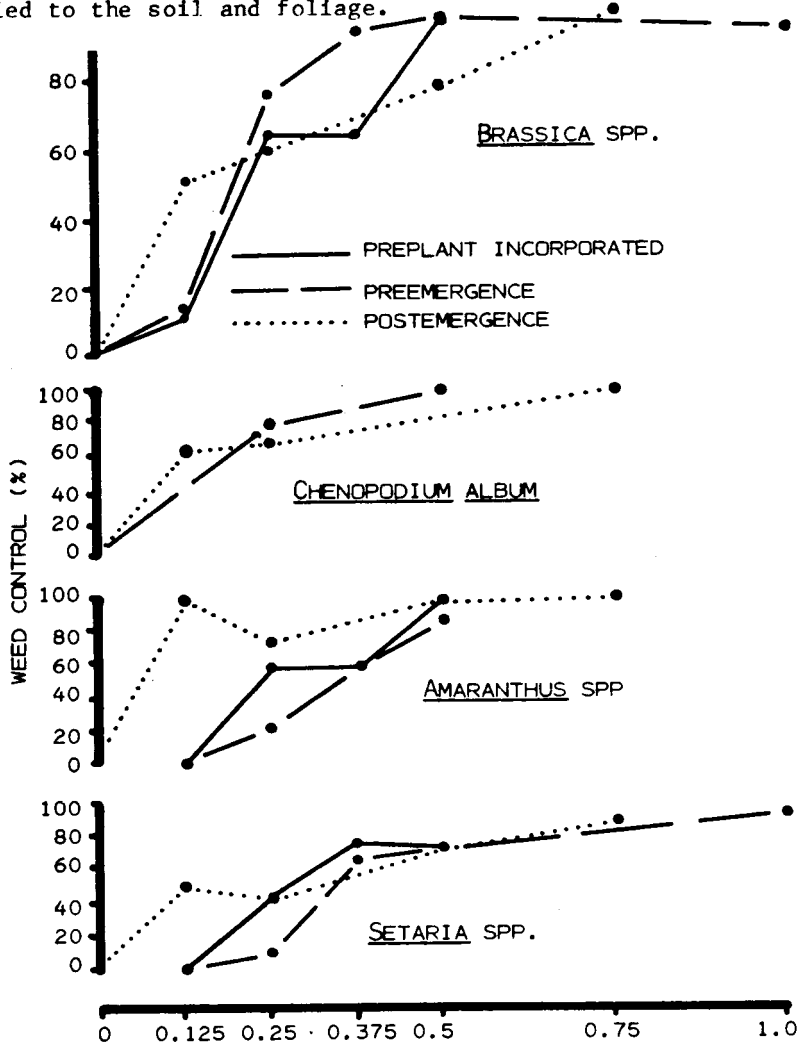
Figure 4. Effect of cyanazine on several annual weeds when applied to the soil and foliage.



(Figures 5 and 6). Rates of 0.5 kg/ha and greater were associated with 15-25% early injury or greater; and with seed yield losses at harvest. The best treatment, 0.375 kg/ha metribuzin applied pre-emergence, requires an additional herbicide in combination for complete annual weed control. Yield losses that occurred with lower rates of metribuzin were most probably due to poor weed control and weed interference. Despite poor overall weed control

yield increases were associated with the 0.125 kg/ha preplant incorporated treatment.

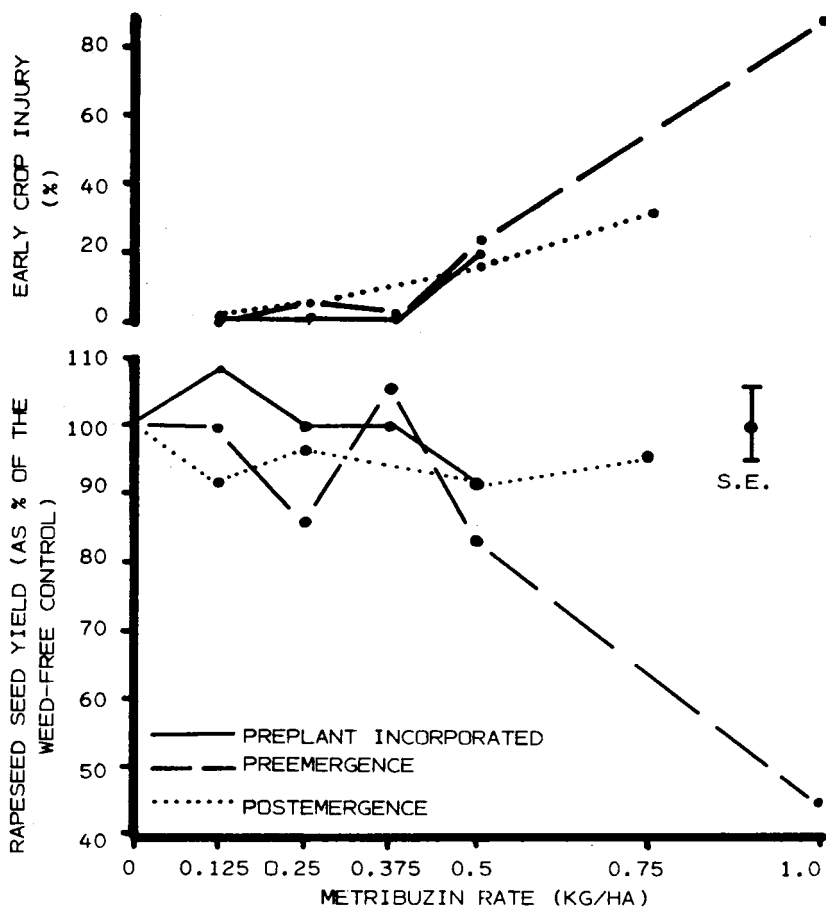
Figure 5. Effect of metribuzin on several annual weeds when applied to the soil and foliage.



References:

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- 2) Dekker, J.H. 1981. Efficacy of several triazine herbicides for annual weed control in triazine resistant rapeseed. *NCWCC Proceedings* 36: 54.

Figure 6. Effect of metribuzin on early crop injury and rapeseed seed yield (expressed as a % of the weed-free control).



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