

USE OF BOTH AVADEx BW AND 2,4-D ON WHEAT AND BARLEY

R.B. McKercher and P.R. Thangudu  
Department of Soil Science  
University of Saskatchewan

INTRODUCTION

It is common farm practice to use a soil incorporated herbicide to control some weed species and a foliar spray herbicide to control other weeds. Although a great deal of research has studied effect of individual herbicides on the crop, relatively little has been concerned with effects the combined use of two different herbicides may have on a crop. The literature does contain some reports of such studies. The reports which are so far available indicate that the thiocarbamates, of which Avadex BW or triallate is an example, may have an antagonistic relationship when used with the growth hormone herbicides, such as 2,4-D, on cereal crops and grasses.

The evidence that a combined use of thiocarbamate and 2,4-D will harm the cereal more than either chemical used separately remains, however, inconclusive. Furthermore, there does not appear to be any research conducted to elucidate on the combined effects Avadex BW and 2,4-D may have on cereals. The objectives of the experiments in this report were to determine if Avadex BW or 2,4-D, used separately or in combination created growth reactions in wheat and barley which were different from those of untreated plants.

EXPERIMENTAL

Experimental work was conducted during the 1974 and 1975 field seasons. The research objectives in each season were similar but the techniques differed somewhat. During 1974 the tests were conducted at the Goodale University Farm. Wheat and barley plots were each seeded with fertilizers according to Soil Test Laboratory recommendations. Avadex BW was then sprayed at 0, 1.4 and 2.24 kg per ha of active ingredient and then all plots were immediately double harrowed. The seed was therefore below the Avadex BW layer. At the fourth leaf stage, at one week and at two weeks following this, 2,4-D was sprayed at 0 and 0.56 kg per ha (about 8 oz a.i. per acre). All 2,4-D sprayings were on plots not previously treated with 2,4-D. The crops were sampled at one week and at two weeks following the 2,4-D spray for dry matter weight and nitrogen content by taking all the above ground parts over a square meter. Grain yields from square meter areas were taken in the autumn. All tests were replicated four times.

In 1975, the procedure differed as follows. The plots were located on the University Seed Farm, Saskatoon, on a soil similar to that on the Goodale Farm. One rate, 2.24 kg per ha of Avadex BW was applied and 2,4-D was sprayed twice, once at the fourth leaf stage and again one week later. Both plot areas were treated with Avadex BW prior to seeding and the seed was placed into the Avadex BW treated soil.

## RESULTS

For barley in 1974 and 1975 and for wheat in 1974, applications of Avadex BW and 2,4-D either alone or in combination did not affect dry matter production, % nitrogen in the above-ground plant material, or seed yield. No attempt will be made here to present all the data which was collected but Table 1 will illustrate the relatively good uniformity of the data. Maximum variability of the data does not exceed 10% of the highest value recorded and there are no statistically significant differences at the 5% level of probability.

In 1975 the crops were seeded into the Avadex BW treated soil layer and this practice damaged the wheat. This is illustrated in the data recorded in Table 2. It is to be noted that the effect on wheat was due entirely to seeding it into the Avadex BW-treated soil and that the presence or absence of 2,4-D whether or not in combination with Avadex BW did not affect dry matter production. The necessity to seed wheat below the Avadex BW-treated soil has previously been well established.

## OTHER OBSERVATIONS

Careful and regular visual assessments were kept of the plots and these produced some interesting observations. One of course is the disastrous effect of placing wheat seeds into Avadex Bw-treated soil. However, a more interesting comparison arises between wheat and barley and their reaction toward 2,4-D.

Barley maturity was delayed by early application of 2,4-D. Our observations record maturity delays of at least one week when barley was sprayed with 2,4-D at the fourth leaf stage or one week after this stage. No maturity delays occurred when 2,4-D was used two weeks after the four leaf stage.

Wheat reacted differently. Maturity delays occurred with the later sprayings but not at the four leaf stage.

A further observation was that barley seeded into the Avadex Bw-treated soil and receiving 2,4-D looked better than those plots which were treated with either chemical separately. The effect of placing wheat into triallate treated soil has already received comment.

## CONCLUSIONS

Wheat and barley can be safely treated with both Avadex BW and 2,4-D provided recommended practices of use are followed. In a situation where one has a choice in timing of spraying 2,4-D to either wheat or barley both coming concurrently to the four leaf stage, consideration should be given to spraying the wheat immediately and treating the barley later.

TABLE 1 Grain yield (g per m<sup>2</sup>) of barley treated with Avadex BW in combination with 2,4-D (0.56 kg per ha) applied at three growth stages during 1974.

Avadex BW Kg/ha	No 2,4-D	<u>Growth stage at the time of 2,4-D application</u>		
		<u>4-leaf</u>	<u>4-leaf + 1 wk</u>	<u>4-leaf + 2 wk</u>
0	372	362	354	367
1.4	381	382	378	388
2.24	368	378	393	372

TABLE 2 Dry matter weights (g per m<sup>2</sup>) of wheat seeded into Avadex BW-treated soil in combination and without applications of 2,4-D at 0.56 kg per ha.

Avadex BW Kg/ha	No 2,4-D	<u>Growth stage at time of 2,4-D application</u>	
		<u>4-leaf</u>	<u>4-leaf + 1 wk</u>
0	*128a	138a	128a
2.24	79b	70b	71b

\* Values followed by the same letter are not significantly different at the 5% probability level according to Duncan's multiple range test.