Control of wild oats

J G. Paterson

Follow this and additional works at: https://researchlibrary.agric.wa.gov.au/journal_agriculture4

Part of the Agronomy and Crop Sciences Commons, Plant Biology Commons, and the Weed Science Commons

Recommended Citation

This article is brought to you for free and open access by Research Library. It has been accepted for inclusion in Journal of the Department of Agriculture, Western Australia, Series 4 by an authorized administrator of Research Library. For more information, please contact jennifer.heathcote@agric.wa.gov.au, sandra.papenfus@agric.wa.gov.au.
IMPORTANT DISCLAIMER

This document has been obtained from DAFWA's research library website (researchlibrary.agric.wa.gov.au) which hosts DAFWA's archival research publications. Although reasonable care was taken to make the information in the document accurate at the time it was first published, DAFWA does not make any representations or warranties about its accuracy, reliability, currency, completeness or suitability for any particular purpose. It may be out of date, inaccurate or misleading or conflict with current laws, policies or practices. DAFWA has not reviewed or revised the information before making the document available from its research library website. Before using the information, you should carefully evaluate its accuracy, currency, completeness and relevance for your purposes. We recommend you also search for more recent information on DAFWA's research library website, DAFWA's main website (https://www.agric.wa.gov.au) and other appropriate websites and sources.

Information in, or referred to in, documents on DAFWA's research library website is not tailored to the circumstances of individual farms, people or businesses, and does not constitute legal, business, scientific, agricultural or farm management advice. We recommend before making any significant decisions, you obtain advice from appropriate professionals who have taken into account your individual circumstances and objectives.

The Chief Executive Officer of the Department of Agriculture and Food and the State of Western Australia and their employees and agents (collectively and individually referred to below as DAFWA) accept no liability whatsoever, by reason of negligence or otherwise, arising from any use or release of information in, or referred to in, this document, or any error, inaccuracy or omission in the information.
CONTROL OF WILD OATS

Two chemicals are now available for the control of wild oats in wheat. This article compares their relative merits and gives recommendations for their use.

By J. G. PATERSON, B.A., B.Sc. (Agric.), Adviser, Biological Services Division

WILD OATS are widespread throughout the world. Their importance can be gauged from the fact that in the wheat growing areas of Canada and the U.S.A. some 60 million acres are infested.

During the past few years many reports have been received indicating that wild oats are becoming a serious problem to wheat farmers throughout Western Australia.

It has been estimated that, of the 97 million bushels of wheat received by Cooperative Bulk Handling Ltd. in Western Australia this season, some 2½ million bushels were subject to dockage for wild oat content. Calculated on the basis of eight cents per bushel this could represent some $200,000 to wheat growers. There is a further loss due to reduced yields because of competition.

One of the most important features of the wild oat is its ability to set large numbers of viable seeds—about 250 to 500 per plant. A medium infestation of some 50 plants per square yards would yield a potential plant population for the next year of some six million per acre. This is at least ten times the number of wheat plants in an average crop.

Trials carried out in recent years have indicated that chemicals, although not giving complete control of wild oats, would raise wheat yields sufficiently to warrant their use under ideal conditions.

Chemicals available

The two chemicals available are:

Tri-allate*—marketed as Avadex BW and distributed by Monsanto Chemicals (Aust.).

Barban*—marketed as Carbyne and distributed by Lanes (W.A.) Pty. Ltd.

In practice, the essential difference between the two products is in their method of application, which is related to their effect on the plant.

Avadex BW is a pre-emergence material which must be applied at seeding time, before the wild oats have germinated. After this it will not affect wild oats even in the seedling stage.

Carbyne is a post emergence material which should be applied after seeding, when the wild oats are in the 1 to 2½-leaf stage.

It has been estimated that some 20,000 to 25,000 acres of wheat were treated with

* These materials are only available under the trade names indicated and all future references in this article are under these names.
these chemicals in 1966 and there is little doubt that this area will increase in the future.

**Application techniques**

**AVADEX BW:**

As it is a pre-emergent material, acting on the germinating seed, Avadex BW must be placed as close to the seed as possible. This necessitates incorporation into the soil immediately after application. Where this is not carried out the chemical rapidly disperses into the atmosphere and is lost.

The active material should be sprayed onto the soil surface in 7 to 10 gallons of water per acre and immediately incorporated with five or six-row covering harrows. If these are not available, two sets of three-row harrows should be used.

Where soil conditions do not allow complete incorporation, less effective results can be expected. For this reason the seedbed should not be cloddy, nor too wet or dry.

A useful technique is to apply the chemical by means of a boom spray attached to the front of a drill and to use the seeding operation to incorporate the Avadex BW into the soil.

Department of Agriculture trials have shown that Avadex BW applied either two days before or two days after seeding is equally effective and no toxic effects on the wheat can be expected.

Avadex BW cannot be applied effectively from aircraft.

**CARBYNE:**

Carbyne is a post-emergent material and must be applied when the wild oats have between 1 and 2½ leaves. This stage is illustrated in Figure 1. Where the majority of the oats are either younger or older, Carbyne treatment cannot be recommended.

This stage is generally reached some three or four weeks after seeding. The material should be applied in 7 to 10 gallons of water per acre where a boom spray is used. Satisfactory results can be obtained from aircraft application; however it is essential to apply at least 3 gallons of water per acre.

**Crop tolerance**

Both chemicals are designed to selectively control oats in wheat and barley. For this reason it is important to know whether the chemical may have any detrimental effect on the crop.

Tolerance trials have indicated that both Avadex BW and Carbyne are safe to apply to the four varieties of wheat tested, namely Falcon, Gabo, Gamenya and Wagin, even if some slight error in application techniques occurs.

Similarly the barley varieties Beecher and Dampier can be treated with safety,
When the density of wild oats reaches proportions such as these the use of chemicals should be considered.

while damage can result with Prior and Atlas 57 varieties if the application techniques are not correct.

AVADEX BW:

To test the importance of soil incorporation Avadex BW at two pints of product per acre was applied with various degrees of harrowing. One set of three-row covering harrows was considered light incorporation, two sets were considered heavy while the third treatment was not harrowed at all.

Where the chemical was applied to Prior barley and heavily incorporated, the yield was reduced by some 15 per cent. This may have been a seasonal effect but warrants further investigation.

CARBYNE:

To test the importance of time of application, Carbyne, at 2 pints of product per acre was applied at various stages of wild oat development.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Do not Spray</th>
<th>Spray</th>
<th>Do not spray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seedling</td>
<td>too early</td>
<td>1 Leaf Stage</td>
<td>2 Leaf Stage</td>
</tr>
<tr>
<td>1 Leaf Stage</td>
<td>Spray</td>
<td>Spray</td>
<td>Spray</td>
</tr>
<tr>
<td>2 Leaf Stage</td>
<td>Spray</td>
<td>Spray</td>
<td>Spray</td>
</tr>
<tr>
<td>2½ Leaf Stage</td>
<td>Spray</td>
<td>Spray</td>
<td>Spray</td>
</tr>
<tr>
<td>3 Leaf Stage</td>
<td>Do not spray</td>
<td>Do not spray</td>
<td>Do not spray</td>
</tr>
</tbody>
</table>

Fig. 1.—The correct stage to apply carbyne should be judged by the number of leaves on the majority of the wild oat plants.
Now an oil so outstanding it does the work of five!

And it protects your tractor from corrosion while standing idle.

From Castrol, the lubrication specialists, comes the most advanced tractor oil ever developed. Agricastrol Multi-Use.

An oil so outstanding that it easily meets your five major lubrication needs—in diesel engines, kerosine engines, petrol engines, hydraulic systems and transmissions, where standard mineral oil is recommended.

And it saves you money.

• Wastage is cut to the absolute minimum
• One oil—one drum saves storage space • You save by buying in volume
• Lower cost level reduces your outlay • There are no costly errors caused by using the wrong lubricant. An oil so outstanding that it gives you these important benefits. • It effectively combats corrosive attack on engine and transmission components during your tractors’ idle periods. • It provides measurably longer life to vital parts such as valve train and transmission. • It ensures safe, efficient lubrication during initial cold starts and during sustained high operating temperatures without the formation of harmful gums and resins. • It meets the demands of complex, modern engines by reducing carbon deposits and their corrosive by-products.

Agricastrol Multi-Use Tractor Oil is specially developed for the man on the land. Note: Agricastrol Multi-Use passes all M.S. sequence tests, meets Supplement 1 requirements and A.P.I. Service D.G. and D.M. Where other particular specification motor oils, gear oils or transmission oils are called for these should be used.

Agricastrol Multi-Use is not suitable as a replacement for hypoid gear oils. Approved by leading tractor manufacturers.
Versatile 'K-in-Circle' Toolbar Components save you money—save you time! You can design and build to suit your need from a single Toolbar, to a double, or to a 10 ft. wide triple Toolbar, with 20 coil tines, as illustrated. You can choose any combination of coil tines, rigid tines and furrowers, reversible disc units and depth wheels, that your job demands, and fit them exactly as you want them. The simple but unique 'K-in-Circle' wedge and clamp design enables you to build for a particular purpose and then to change in minutes for another. No spanners, no nuts, no bolts! Just bed the engineering-designed and field-tested wedges into place with a hammer, or just as simply remove them. You invest in your future when you buy 'K-in-Circle' Toolbar Components because the Ralph McKay Group are continually searching for and designing new accessories, that will save you money, save you time—and work more efficiently for you.

'K-in-Circle' Toolbar Components are made to suit:
- Category 1 Linkage with 2" Toolbar
- Category 2 Linkage with 2½" Toolbar
- Category 2 Linkage with 2" Toolbar
- 1" or 1½" Square Coil Tines

Write today for full details, or contact your local 'K-in-Circle' Dealer—he can help you!

MULTIPURPOSE TOOLBAR COMPONENTS

MANUFACTURED BY THE RALPH McKay GROUP, MELBOURNE & ADELAIDE

Elders-GM

113 St. George's Terrace, Perth
Telephone: 21 0141, 21 2691
Branches and Agents throughout the State

Please mention the "Journal of Agriculture of W.A." when writing to advertisers.
acre, was applied three, four and five weeks after sowing.

The four week treatment was the ideal time and the three and five week stages were too early and too late respectively. No reduction in yield was obtained with any of the wheat varieties tested. A reduction of 20 per cent. resulted when Prior barley was treated at a stage later than the optimum. A similar reduction occurred when Atlas 57 barley was treated too early.

Avadex BW or Carbyne?

Trials were carried out to compare the relative effectiveness of each chemical. It was found that both products gave an increase in yield when applied under ideal conditions but neither was capable of complete control of wild oats. For this reason the actual yield increase was far below that obtained when no oats were present.

Experimental details

In the trials discussed five treatments were used with four replications at three sites. At each site treatments were applied with ground equipment to an infested and an oat free wheat crop. Cultivated oats were sown to simulate the effects of wild oats. In previous trials it had been shown that, where cultivated oats are evenly distributed through the top few inches of the soil, they respond similarly to wild oats in both reaction to the chemicals and competitive effect.

The conditions at the time of each treatment were apparently ideal.

Results and discussion

Figure 2 illustrates the effect of the various treatments. The highest yield on the infested plots was obtained with Carbyne at 2 pints per acre. An extra bushel of wheat was obtained when Avadex BW was heavily, rather than lightly, incorporated and this illustrates the need for thorough mixing of the chemical with the soil. Where no incorporation was used the yields were no better than without Avadex BW.

The control of oats with Avadex BW over all three sites was only half that obtained with Carbyne; however there was a marked difference between sites in the

![Yield Bushels/Acre Graph](image_url)

Fig. 2.—The average yield of wheat and oats at three sites, obtained following the treatments indicated.

163
Table 1.—The yield of wheat obtained following treatment with Avadex BW and Carbyne. Untreated and potential yields are shown for comparison

<table>
<thead>
<tr>
<th>Site</th>
<th>Avadex BW</th>
<th>Carbyne</th>
<th>No chemical treatment</th>
<th>No oat competition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yield</td>
<td>Control of oats</td>
<td>Yield</td>
<td>Control of oats</td>
</tr>
<tr>
<td>Merredin ...</td>
<td>30.9</td>
<td>70%</td>
<td>31.6</td>
<td>80%</td>
</tr>
<tr>
<td>Wongan Hills</td>
<td>13.0</td>
<td>30%</td>
<td>17.3</td>
<td>75%</td>
</tr>
<tr>
<td>Beverley</td>
<td>19.2</td>
<td>15%</td>
<td>26.5</td>
<td>60%</td>
</tr>
<tr>
<td>Average</td>
<td>21.0</td>
<td>38%</td>
<td>25.1</td>
<td>72%</td>
</tr>
</tbody>
</table>

Avadex BW plots. This variability emphasises the strict control over application times and techniques which both Avadex BW and Carbyne demand.

Even with 80 per cent control of oats the yield was 10 bushels per acre below the plots which had no oats present.

RECOMMENDATIONS AND COSTS

For the control of wild oats either Avadex BW or Carbyne can be used.

Being a pre-emergence chemical Avadex BW should be used only where a heavy stand of wild oats will occur.

At current retail prices, treatment at 1½ pints per acre would cost about $4.50 for chemical plus application.

Where the degree of infestation is unknown, Carbyne should be considered. This must be after germination but only when the wild oats are within the 1 to 2½ leaf stage.

Treatment at 2 pints per acre would cost about $4.25 for chemical plus application. Based on information supplied to this Department aerial application of this product at the recommended rate would cost about $4.50 an acre where several hundred acres are involved.

REFERENCE

Interested in

BOREHOLE PUMPING

This is one you MUST SEE!

The low-cost, highly efficient

MONO-lift

BOREHOLE PUMP

You’ll save all ways with a Mono-Lift Borehole Pump, because Mono-Lift uses the simplest and most efficient of all pumping mechanisms to:

- Minimise Price.
- Cut maintenance.
- Simplify installation.
- Reduce horsepower.
- Yield more water for every dollar of price and unit of horsepower.

How does Mono do it? . . . By adapting the well-known principle of Rotor/Stator operation to borehole usage.

The result? . . . A simple unit which requires only the wear-resistant rotor and stator element to be immersed at the bottom of the bore. All other drive mechanism locates at ground level, and Mono-Lift achieves full efficiency from minimum horsepower, without the need for pistons, buckets or other wear-creating moving parts.

Stainless steel drive shaft. All sizes from 100 to 10,900 g.p.h.; up to 400 ft. total head. Supplied complete with electric motor and V-drive; available also for petrol, diesel or tractor drive.

MONO PUMPS (AUSTRALIA) PTY. LTD.

HEAD OFFICE: “MONO HOUSE,” LOWER DANDENONG ROAD,
MORDIALLOC, VICTORIA • 90 5211

- N.S.WALES: 142 ROCKY PT. RD., KOOGARA 58 8222
- NEWCASTLE: 14 EXCELSIOR PDE., TORETO 59 1720
- WEST AUSTRALIA: 664A MURRAY ST., PERTH 21 5618
- QUEENSLAND: 2 GLENTANNA RD., REDON 59 6466
- STH. AUSTRALIA: 119 WAYMOUTH ST., ADELAIDE 51 6766
- TASMANIA: 51 DION CR., RIVERSIDE, LAUNCESTON 27 3541

Please mention the “Journal of Agriculture of W.A.” when writing to advertisers.