



Department of
Primary Industries and
Regional Development

Journal of the Department of Agriculture, Western Australia, Series 4

Volume 22
Number 1 1981

Article 8

1-1-1981

Cropping with herbicides : present and future

Geoffrey A. Pearce

Follow this and additional works at: https://library.dpird.wa.gov.au/journal_agriculture4

Recommended Citation

Pearce, Geoffrey A. (1981) "Cropping with herbicides : present and future," *Journal of the Department of Agriculture, Western Australia, Series 4*: Vol. 22: No. 1, Article 8.

Available at: https://library.dpird.wa.gov.au/journal_agriculture4/vol22/iss1/8

This article is brought to you for free and open access by the Agriculture at Digital Library. It has been accepted for inclusion in Journal of the Department of Agriculture, Western Australia, Series 4 by an authorized administrator of Digital Library. For more information, please contact library@dpird.wa.gov.au.

Cropping with herbicides . . . present and future

Farmers spent about \$14 million in 1980 on herbicides to kill weeds in their cereal crops. They bought enough chemicals to treat more than three million hectares. These are the results of a survey carried out by the Department of Agriculture. The figures include herbicides used for direct drilling, and take into account the many cases of crops which were sprayed with two or more chemicals.

The total cost is much higher when the application and capital costs of equipment are added.

Because there is an obvious carryover of herbicides from one year to another, the estimated amounts were reduced by 20 per cent. This is a very arbitrary figure as some allowance also must be made for the previous year's carryover.

Herbicides for wild oats control cost farmers about \$2.4 million in 1980, to treat 140,000 ha. About 935,000 ha of annual ryegrass cost \$5.1 million for pre- and post-emergence treatment. Broadleaved weeds cost \$7.6 million to treat 2.15 million ha, including 248,000 ha of sprayseed.

Principal Research Officer G. A. Pearce, of the Plant Research Division's Weed Agronomy Branch assesses the part herbicides are playing in Western Australian agriculture today, and gives some valuable indications of the contributions they could make in the future.

Cost of weeds

Last year, Western Australia's farmers spent \$15 million on chemicals for controlling their weeds, as well as substantial outlays for spraying equipment. It is logical to ask what they received in return. Estimates of the cost to the farming community of weeds in cereal crops reveal that the farmer could be losing a minimum of \$42 million each year at the present time. If herbicides were not available the cost would jump to more than \$200 million a year.

Assumptions

- **Delay in planting.** At least 50 per cent of the cereal crop has weed



problems which would require additional cultivations if herbicides were not available. A minimum of three extra workings would be needed and this would delay planting by about 4 weeks. Such a delay would result in a yield loss of at least 250 kg/ha.

The information presented in this article was supplied by the State distributors of agricultural chemicals. Without their assistance and co-operation the survey would not have been possible.

- **Extra cultivations.** Without weeds, most crops would require no more than two cultivations. At present about 40 per cent of the crop receives one extra cultivation. Without herbicides, at least 50 per cent of the crop would require a minimum of three extra cultivations to control weeds.

- **Loss in yield.** Well over a million hectares of cereals are sprayed each year after the crop has reached the tillering stage. Spraying with herbicides two to four weeks earlier would give an increase in yield of at least 125 kg/ha. Without herbicides, and despite many extra cultivations, crops would be infested with weeds

Aircraft are now used extensively for spraying herbicides for grassy crop weeds.

such as wild oats, ryegrass and radish. A yield loss of 475 kg/ha would be likely.

- **Loss in quality.** Dockages due to the presence of weed seeds last year cost farmers \$300,000. A very large increase would occur without the use of herbicides. At least half the crop could be affected.

- **Land value effects.** Weeds which are difficult to control by cultivation could become so dense that cropping would be impractical. A drop in land values would occur. Because of the additional work involved in planting crops without herbicides, the area planted each year would decline.

Cost of herbicides

Anyone associated with the agricultural chemical industry knows that in many instances the cost of herbicides has not increased greatly during the past 20 years.

In the early 1950s, farmers were paying approximately \$5.30 per litre for 2,4-D ester 80. Today the price is about \$4.75. Many other proprietary lines' prices have been reduced since their introduction.

New herbicides on the other hand, protected by patent or some commercial advantage, can be expected to cost more in the future. The pricing of such products is a commercial judgement which enables the manufacturer to recoup his development costs as quickly as possible and yet leave an attractive profit margin for the farmer. Sometimes such judgements are inaccurate, or influenced by other world markets, so that it becomes very difficult for the farmer to meet the cost of a herbicide treatment, and still be well recompensed for his outlay.

The most widely used herbicide is still 2,4-D. Although it is the lowest priced treatment, it does not give the best yield increases.

One can calculate from the tables that the average cost per hectare for herbicides for wild oat control was \$17.20, for ryegrass \$5.47, and for broadleaved weeds \$3.53. It becomes very obvious that farmers can only make substantial savings from herbicides by checking out the economics of using the most-costly treatments.

Because of the low cost, the outlay for treating broadleaved weeds is very quickly recouped from increased crop yields. However, farmers using more expensive wild oat or ryegrass herbicides should be more careful in estimating whether the profit to be gained is worthwhile.

Weed numbers determine yield increase

The yield increase obtained when weeds are killed in a crop is dependent on a number of factors. Crops with a high potential yield will respond better to weed removal than less favoured crops. Spraying should be carried out when the weeds are as small as possible. Generally one can conclude that any crop with more than 20 wild oat or 40 ryegrass plants per square metre is worth spraying if the potential yield is about 1.5 tonnes per hectare. Using a cheaper herbicide such as trifluralin for ryegrass, it is probably worthwhile spraying even if the numbers are as low as 30 per square metre. A

similar rule applies to broadleaved weeds but still lower numbers will justify spraying.

New developments

- Aerial application for direct drilling. Trials at Wongan Hills and Newdegate Research Stations in 1980 have shown that both Spray Seed® and Roundup® can be applied effectively from the air. The standard rates of application can be used in 30 litres of water per hectare for Spray Seed and 15 litres for Roundup.
- Hoegrass® Mixtures. Many crops which are sprayed with Hoegrass also have a broadleaved weed problem. When the hormone-like herbicides 2,4-D or MCPA are added, Hoegrass is inactivated to a degree, depending on the amount of the other chemicals included.

Trials have shown that bromoxynil/MCPA, linuron or Tribunil® are the most suitable herbicides for adding to Hoegrass. Because the first herbicide mentioned contains MCPA, the rate of the commercial mixture should not exceed 1.0 L/ha when used with Hoegrass. Wetting agent should not be added to the mixture and the rate of Hoegrass in the mixture should be 1.0 L/ha. It

could be more economical to spray twice, using a cheaper broadleaved herbicide applied 10 days after the Hoegrass, than worrying about a mixture, provided it is practical to spray a second time.

- DPX-4189. This new Dupont product has proved to be effective against soursob, ryegrass, brome grass and broadleaved weeds at rates as low as 20 g/ha. It can be applied before or after planting. At least one more year of development work is required before it becomes commercial. Although DPX is a very fascinating development, its cost may not allow it to be used as a replacement for all the alternative herbicides used at present. It is expected to compete against the more-costly herbicide treatments, particularly to control a variety of weeds at once.

What of the future?

One can only see an increasing use of herbicides by farmers. However, there are likely to be a number of changes which will affect the present practices of killing weeds in cereal crops.

The effect of spraying wild oats with today's selective herbicides



- **Mixtures:** 'Home brew' mixtures are becoming widely accepted and the amount of damage being caused is not often reported. It is taken for granted that label recommendations can be followed safely, but users should remember that making up mixtures can be very dangerous, even when they have been found to work with a single trial. Farmers should wait until adequate trial work has been carried out to justify registration of new treatments. Proven mixtures will gradually be added to labels for registered products.

- **The risk of erosion from cropping** is being recognised widely and this will encourage farmers to reduce their cultivation and adopt more direct-drilling techniques. Continuous cropping programmes will introduce new cost saving strategies for weed control. Using highly effective, but perhaps more costly treatments, farmers should be looking to eliminate their weeds in the first year or two. This would allow several successive crops to be grown without the need for spraying. This is possible now with Hoegrass used on ryegrass, and as more information becomes available on the seed life of different weeds, it may well be practical with other species. The Department of Agriculture is starting a programme this year to determine how long control measures must be undertaken to eliminate dormant seed of the major weed species.

- **Spraying technology:** This is another area in which worthwhile developments are starting. The new Terramatic Boomsprayer enables the correct amount of pesticide to be metered into the spray line without tank mixing. This system provides a number of advantages, and is only the start of new technology being developed.

- **The Wheat Research Council** is financing a very ambitious research programme in Victoria in which all aspects of spraying techniques will be investigated. A team of research workers from different professions will work together to investigate such factors as droplet size, volume of application, nozzle spray patterns and the importance of chemical



formulations. Such a project will provide useful information for use around Australia. It is not practical to duplicate such research in Western Australia. No doubt farmers and others will continue to improvise and develop new ideas more quickly than can be proven by properly conducted trials. Such ideas are extremely useful if successful but very costly if they don't work.

- **Time of application:** More than half the crops treated for broadleaved weeds are sprayed six weeks or longer after planting. By this time much of the damage from competition has been done and most of the possible yield increase has been lost. Farmers must realise that the cheapest herbicide is not always the most economical. Extensive trials have demonstrated that spray timing is measurable

Above: The dramatic effect of selective spraying for wild radish.

Below: Direct drilling can give results like this.

directly in terms of crop yield. Yield increase can be lost by delayed spraying. Farmer education will lead to a bigger proportion of crop spraying being carried out within the first three to four weeks.

- **Direct drilling of crops:** In 1981 the areas direct-drilled could be 10 per cent of the total crop planted. With attention being focused more and more on soil erosion and salt encroachment, farmers no doubt will continue to swing more and more to these techniques in the future. Aerial application will be very attractive to farmers who wish to use their time and resources in other directions.