

WEED CONTROL IN STREAMS - PROTECTING
THE DOWNSTREAM USER

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Summary. There are weaknesses in the control of aquatic weed control practices in Australia and aquatic systems are being harmed by over-zealous individuals using either chemical, mechanical or habitat manipulation methods. Aquatic systems can be divided into open and closed systems. With open systems (creeks, rivers and wetlands) the water is put to many different uses, whereas with closed systems the water is contained within an area where a group of people have a common interest in the water. Open systems require more careful assessment before control measures are undertaken. Changes are taking place in aquatic weed control to place more emphasis on prevention of the problem, more careful assessment before control action is undertaken and on alerting the downstream water user of impending contamination of the stream with herbicides.

INTRODUCTION

Aquatic weed control in Australia is now approaching the same position as aquatic weed control in North America and Europe, that is, more and more restrictions are being applied to prevent organisations and individuals from interfering with or contaminating aquatic systems. Since we are not subject to as many restraints however, there are localities where the aquatic environment is being harmed by over-zealous weed control by either chemical or habitat manipulation methods. Aquatic weed control or weed control adjacent to aquatic situations requires special consideration as the operation is directly in contact with our precious commodity - water.

As would be expected, the number of herbicides permitted for use in aquatic situations is getting less and the tendency is towards those with a short residual life. However, whilst many authorities in Australia have regulations to prevent contamination of streams and wetlands with herbicides a lot of misuse and contamination is still continuing, since many individuals do not realize restrictions exist. There are also many differences between the States and a more uniform approach is needed.

The main intent of this paper is to draw attention to some weaknesses in the control of aquatic weed control practices in Australia.

AQUATIC SYSTEMS

Aquatic systems include irrigation, drainage, wetlands and storages. There are two distinct types of aquatic systems in Australia, known as open and closed systems.

Closed systems are those in which the water is kept within a farm or group of farms and does not flow to other areas. Individuals within the system are aware of any herbicide contamination and there is a common interest in the water. Closed systems include a bore drain flow that is completely used within

one property or group of properties or a public or private irrigation system with no drainage or direct connection to streams that flow away from the locality.

Open systems are those in which the water flows through localities with different interests in the water. Open systems include town drains, most creeks and rivers, lakes and some storages. Individuals within the system use the water for many purposes - e.g. for drinking, swimming and irrigation - and have difficulty in finding out what contaminants are in the stream.

Closed systems can safely use toxic but short life herbicides like acrolein as well as long-life chemicals such as diuron, but open systems present a greater problem since downstream users prefer no contamination at all and want zero risk. Unfortunately it is not possible to have zero risk.

Advising the downstream user. Individuals and organisations have a responsibility to regularly advise downstream users of their intention to contaminate a system, but this poses a dilemma since the reaction to a safe contamination may be unfavourable. Where the operation is publicly funded, the downstream users have the right to know of contamination, and if it is within prescribed limits of State regulations since they are paying for an organisation to contaminate the water.

MISUSE OF HERBICIDES AND OTHER FORMS OF HERBICIDE CONTAMINATION

A typical example of lack of awareness of the effects of herbicides on the aquatic environment could be as follows:

A group of landholders or an organisation decides that cumbungi (*Typha* spp.), blackberries (*Rubus* spp.) and eucalypts (*Eucalyptus* spp.) are blocking a small stream, and it is decided to use amitrole, 2,4,5-T and picloram to do the job. The application is done during the low stream flows of late summer and a sum total of hundreds of litres of herbicide are applied. A good kill is obtained and the fact that herbicide residues in the stream reach levels as high as 10 ppm is not given much thought on the principle that: "Our little bit of contamination won't matter". There is a failure to recognise that others are also contaminating the system, and what was a small contamination can amount to a large one downstream. The downstream user fortunately or unfortunately, depending on how you look at it, usually doesn't know what has happened and the whole exercise goes unnoticed.

In some parts of Australia, aircraft carrying out terrestrial weed control include the creeks, rivers, channels or dams in the operation. Herbicide enters the water when the spray is not cut-off when crossing the water or drifts into the water body. As well, tankers spraying railway lines do not always cut-off when crossing bridges over streams.

Where the application is not directed at aquatic plants but is adjacent to a stream [e.g. blackberries overhanging the stream or groundsel bush (*Baccharis halimifolia*) on the banks] the same restrictions on the use of herbicides targeted directly to aquatic plants should apply. In this type of spray operation there is often scant care taken to keep the herbicide out of the water. Research on contamination of streams from bank spray operations has shown that between 10% and 25% of the total chemical targeted at bank plants will contaminate the adjacent water. The label may indicate "do not contaminate water", or the authority may have a policy of keeping the chemical out of water. Despite this, water is contaminated from this type of operation because spray operators can be careless and constant supervision is difficult in the field.

WHAT OF THE FUTURE?

Aquatic weed control must develop towards leaving the environment not only unharmed but also substantially untouched. This means that:

1. Control measures will be substantially replaced by action to prevent the problem,
2. More careful assessment will need to be made before control measures are implemented,
3. A greater mixture of methods will need to be used for each problem including mechanical, biological, chemical, replacement vegetation and habitat manipulation,
4. More stringent regulations will be needed to prevent needless contamination of the environment and more consideration placed on the individuals downstream of a treatment, and
5. The prime consideration will need to be the environment (including the spray operator) with less emphasis being given to weed control.

Ultimately, through pressure exerted from many directions, herbicides will only be applied to open systems by permit or by approved operators. This will ensure that the treatment is according to the permit issued and that downstream users are advised of the impending treatment. This is consistent with the policy of the Environmental Protection Agency in the U.S.A., which operates on the premise that citizens have the right to know which chemicals they may be exposed to.

A National Committee on the Management of Aquatic Weeds has been formed recently by the Australian Water Resources Council and the Australian Agricultural Council. It will produce a document "Guidelines for the Use of Herbicides in Water" and it is intended that these guidelines will be the start of a national policy with particular relevance to streams that cross State borders. An example of this change is already taking place in the N.S.W. Water Resources Commission. The Commission applies herbicides to closed and open aquatic systems and has had to take considerable care in ensuring that its aquatic weed control methods will not harm or be alleged to harm the environment.

Over the next two years the Commission will

1. Reduce the number of herbicides used in open systems to acrolein, glyphosate and TCA (except where plants resistant to these herbicides grow prolifically and cause obstruction),
2. Reduce the overall usage of these herbicides by 20%,
3. Use that reduced quantity of herbicide more efficiently, and
4. Step up the effort to increase public awareness of the benefits and risks of careful herbicide use in aquatic situations.