THE NON-CROP WEED CONTROL MARKET - ITS WANTS & NEEDS - A REVIEW

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Summary. The non-crop weed control market is diverse and has many users and requirements. Some of the key factors of the market, its requirements, restraints and weed problems are examined together with a review of the type of products used. An assessment of possible changes that may occur in the future is considered.

INTRODUCTION

Non-crop weed control is carried out in a range of situations and is an area to which a considerable amount of time and effort has been devoted by weed workers over the years in developing products for use in these areas.

Because of the extent of the market there has been considerable development of specific mixtures which have application in this market.

In this paper an attempt is made to review the general requirements of the non-crop herbicide market and indicate how it affects the development and suitability of herbicides for use in this situation.

THE MARKET

The non-crop weed control market is very diverse, has many requirements and does not always require the complete control of all weeds and grasses. Generally what is required is vegetation management.

Vegetation management is a broad term used to describe the results obtained from the application of a herbicide. This could cover control of height and density of species as well as in some situations complete control of these species.

The users of herbicides in the non-crop market are also diverse and as a result so are their requirements. Their requirements can be determined by a variety of factors such as budget restraints, situation restraints, public pressure etc.

While public authorities are major users, there is now a constant demand for vegetation management to satisfy recreational, tourist and other aesthetic demands.

Public pressure and other constraints are issues that must be considered seriously now and in the future as they are likely to become a very important issue in the future and could influence particular programmes.

Non-crop weed control or vegetation management can be required in the following situations - railway lines, firebreaks, gutters, footpaths, parks, irrigation drains, industrial areas etc. This is a very imposing list but it

becomes even more imposing when it is realised that the need for vegetation management occurs in all areas of Australia in both urban and rural communities. Non-crop weed control is often the first line of attack against invading noxious weeds on roadsides, on watersheds etc.

THE WEED PROBLEM

As a consequence of the non-crop market being present in all parts of Australia and in the wide range of situations as indicated and because it encompasses both winter and summer rainfall areas, a wide range of weed and grass problems are encountered.

The weed problem is usually a reflection or result of management practices. In many cases following original disturbance of sites annual weeds either winter or summer are major problems. Inevitably these will be replaced by perennial species which reflect the climatic pattern.

This weed succession is a feature of the problems. Alternatively, it is often found that one weed management system produces other weed problems.

In the main, perennial grasses are the main problem in the summer rainfall area with the main species being paspalum (*paspalum dilatatum*), Johnson's grass (*Sorghum halpense*), Guinea grass (*Panicum maximum*), Couch grass (*Cynodon dactylon*), Red Natal grass (*Rhynchelytrum repens*) etc., plus broadleaf weeds such as Feabane (*Conyza spp.*, *Verbena spp.*etc.) In specific situations such as irrigation channels and drains the dominant species are Cumbungi (*Typha spp.*) and Water couch (*Paspalum paspaloides*).

In the winter rainfall areas annual weeds and grasses tend to be the dominant species with the major ones being Rye grass (*Lolium spp.*), Prairie grass (*Bromus spp.*), Capeweed (*Arctotheca calendula*), *Oxalis spp.* etc. Of the perennials Couch grass is probably the major species overall.

THE REQUIREMENTS OF THE MARKET

These vary considerably and are influenced largely by the factors determining why weed species are a problem in the particular situation.

These can be: Fire hazards, interference with drainage or water flow, vermin control, aesthetics, interference with operation of public utilities, safety aspects, user convenience, interference with maintenance of structure etc.

As can be expected, the degree of vegetation maintenance will vary from control for a short period of time, i.e. 4 to 6 weeks to control for a long period of time - 9 to 12 months. This is determined largely by the requirements of the situation and also by budget restraints and programme adopted.

As a result it is essential that there be a range of products available to satisfy these requirements.

THE RESTRAINTS OF THE MARKET

On the surface the use of and development of herbicides for use in this market should be easier than the development of herbicides for use in selective areas because in the main, the only important consideration is - will the product provide the desired level of control. Unlike the development of selective herbicides crop tolerance, establishment of MRLs etc., does not have to be considered.

In the main this is true, but in the non-crop market other restraints have to be considered such as effect on desirable and adjacent non target species growing in treated areas, safety to the environment, toxicity aspects etc. These factors are more important than in other situations because of the area in which the products are used, the fact that they are often used by relatively unskilled personnel and their use in public areas. As a result toxicity is an important consideration, and unless this aspect is handled with care and understanding industrial problems can ensue.

Applications in respect of both time and equipment also act as restraints. Non-crop herbicides tend to be used at less than optimum times because of the extent of the problem, the lack of proper planning and the requirements of the users. This relatively unsophisticated approach can cause considerable burden and expense on suppliers of products and their technical staff.

From the application equipment point of view it is also very diverse and varies from good to poor. A successful herbicide must have flexibility in this regard and be able to provide the necessary control measures when used under these conditions.

THE PRODUCT

Herbicides are basic and will remain so in this market.

To be successful in the non-crop market a herbicide has to be an efficient compound because of the complexity of the market by way of species to be controlled, the diverse climatic areas in which it is used, the time and manner of application and the job it is expected to perform.

In addition the screening process which leads to the development of herbicides is not directed specifically towards this market, hence adaptations have to be made to products originally developed for use in other situations to enable them to be used in this market.

Single products have generally (with one or two exceptions) not been successful primarily because of the variety of weed species encountered or likely to be encountered, the situation in which the herbicide is to be used, the growth patterns of the weeds and the need to control a wide range of species with different growth stages. To be successful in such a situation is asking a lot of a compound and hence the relatively high use and need for mixtures.

The market basically requires herbicides with either or both knockdown and residual properties.

The successful knockdown herbicides are Amitrole, 2,2-DPA and mixtures of these and more recently Glyphosate. Other herbicides such as TCA have been used in the past plus the inorganics such as Sodium Chlorate and Arsenic.

Until the development of Glyphosate, Amitrole was the cornerstone of products used in this market. This arose because of its effect on both grasses and broadleaf weeds at relatively low rates of application, plus its compatability and synergistic activity with other compounds.

In the residual area the Ureas, Uracils and a range of Triazines have dominated the market and when mixed with Amitrole these have provided products which offered both knockdown and residual control.

Knockdowns have tended to be dominant in the summer rainfall areas, with knockdowns and residuals being dominant in the winter rainfall areas.

The effects of public pressure on herbicides in this market have been seen in respect of Amitrole, and this will probably be the demise of this product. This will further assist the acceptance of Glyphosate into the market.

THE FUTURE

The next 20 years may not see the major changes that have occurred in the past 30 years.

During this period there has been a change from the use of inorganic compounds such as sodium chlorate and arsenic. High rates of application of the organic compounds such as TCA, followed more recently by the use of the more efficient organic compounds applied at relatively low rates of application. The greatly improved residual control provided by these newer compounds together with considerable reductions in toxicity and hazards to the environment has contributed to greater acceptance by this market of herbicides.

Currently most market requirements are satisfied with the existing compounds, and thus it is going to be difficult to introduce new compounds because of their cost plus the relatively small market size which will limit future development.

There is an opportunity for development and use of growth regulating and vegetation suppressing type compounds in many situations. If such a development occurred it would be an acceptable method of vegetation management from all aspects, however this will be a difficult task because of the complexity of the market.

In addition, registration authorities should adopt a different approach to the registration of non-crop herbicides. Rather than concentrate on evaluating the efficacy of a compound they should concentrate on ensuring suitability of these compounds for use in public areas, leaving the developers to concentrate their work in a large number of areas to ensure efficacy of their programmed use rather than conducting detailed trials only in one or two areas or situations. This could well require the development of an appropriate protocol covering development and evaluation.

Users should also be educated to define their needs, their budgets and plan their activities, thus ensuring more efficient and effective use of the products, their budgets and as a result generally meeting their objectives.

For the weeds agronomist the non-crop herbicide market is an interesting market in which to study and predict ecological changes which are likely to occur. Because of the variability of the sites, situations etc., it is vital to the success of a herbicide that such changes be studied over as wide an area as possible rather than in only one or two specific situations.

Wider criteria of safety of herbicides to non target species, environmental safety and safe practical handling will require a deeper assessment in the future.