

Extension aids for community based weed action groups

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Summary A field book, electronic weed identification key and an internet-based mapping program have been developed to help community based weed action groups achieve their goals of reducing weed prevalence in their regions.

The field book 'Southern weeds and their control' is pocket sized and printed on waterproof paper. It contains photographs and descriptions of 130 common weeds and native plants that look similar to the weeds in southern Western Australia. Manual and herbicidal control techniques suitable for community groups are also included.

The weed identification key, 'HerbiKey', is a computer based, polyclave key that covers over 500 naturalised species of southern Australia with descriptions, photographs and management suggestions. It is based on the key and information in the HerbiGuide computer program (Moore and Moore 2002) and designed for people with little botanical training. Users enter plant characters from drop-down boxes that have a diagram of the character. From this approach, a short list of plants with the selected characters is produced. Alternatively, the user can ask the key to determine the character that will best distinguish between the plants on the short list. The advantage of this key over traditional keys is that an identification can often be made without flowering material and characters that the user is not confident of can be skipped.

The mapping system is based on WeedMapper developed by Oregon State University (Johnson 2001) and is an internet based mapping program allowing users to specify points or areas on a map where particular weeds species have been found. It is currently under development for use in Western Australia.

Keywords Aids, community, decision, extension, groups, guides, identification, landcare, mapping, weed.

INTRODUCTION

Many of the 1000 or more naturalised plants in Western Australia (Hussey *et al.* 1997) do not have an economic effect large enough to warrant declaration or government funded control programs. However, the local impact is often severe enough to enthruse local community groups to control them. The members of these groups are from diverse backgrounds and often lack expertise in both identification and control techniques. To assist these groups simple aids have

been developed to identify, map and provide control methods for common weeds.

MATERIALS AND METHODS

Weed action groups across southern Western Australia were surveyed and 130 introduced species that were causing the greatest concern identified. A pocket size, waterproof booklet, 'Southern Weeds and their Control' similar to the 'Ute Guides' used in agriculture, containing plain language descriptions, photographs and control techniques for these species was produced. Distinguishing features of similar native plants were also included to reduce the risk of accidental damage. For the introduced acacias, a dichotomous key distinguishing them from similar native acacias was included. CSIRO standardised plant names have been used (Lazarides *et al.* 1997) with local common names added, if necessary, to reduce confusion. Where possible the herbicidal control is based around easily obtainable and low toxicity herbicides such as glyphosate and metsulfuron and has rates for knapsack spraying. It also includes mechanical, cultural and biological control techniques.

For identification, a computer based, polyclave key, called 'HerbiKey', based on simple characters was developed for 500 of the naturalised species and includes photographs and botanical descriptions to confirm the identification. It includes cotyledon, leaf, stem, flower, fruit, seed, root, and growth type characters to allow identification at any time of the year and with partial specimens. The character lists, descriptions and most photographs were taken from HerbiGuide (Moore and Moore 2002) with other photographs coming from Western Weeds (Hussey *et al.* 1997). The objective of the program is to help the user quickly achieve an identification, so the character lists include the common perceptions as well as the botanically correct characters. For example, when a species has phyllodes, the size and shape are listed under leaves as well as petioles, or when hairs are difficult to see the character list will have both hairy and hairless as a valid response. The program has been evaluated in weed identification workshops and typical mistakes made by the students have been included in the character lists to help future users achieve a correct result. A user can enter a character as 'present' or 'maybe present' or 'don't know'. In general, the negative response has been avoided. For example, if a user

is holding a red rose the flower colour can be scored as red but it cannot be scored as **not** yellow with any confidence because there are yellow forms of which the user may not be aware.

An 'intelligent' dichotomous key has also been implemented which is accessed by an 'Ask' button on the screen. From the current short list of species, previous characters entered and the time of year, the program initially assumes what material the user has (e.g. leaf, flower, seed) and determines the character that best splits the short list. The user responds with a 'Yes', 'No' or 'Don't know' and the process is repeated until all distinguishing characters have been exhausted.

The mapping program is based on WeedMapper (Johnson 2001) from the Oregon State University. This is an internet-based tool and is being modified for use in Western Australia. Data will include weeds that various weed action groups are targeting and some of the declared weeds. Locations of weeds can be entered via a form or the user can go to a screen map and locate the position of their weed or determine if it has already been mapped. Being internet-based, it is ideal for community groups because they can enter data or view maps of the weed distribution from home. It is at a level that is ideal for local school groups to map weed infestations. As a management tool, it allows groups to produce maps of the magnitude of the weed problem that they wish to tackle and allows them to produce projects or plans with appropriate funding and resources.

RESULTS

Pilot versions of the field book 'Southern Weeds and their Control' have been well accepted by Weed action groups and several weed infestations have already been treated using the control information. Photographs from the book have been used in local information pamphlets by at least four weed action groups.

'HerbiKey' has been used in weed identification workshops and it generally leads to a quicker identification of the weed than text based dichotomous keys. More importantly, users feel more confident about the identification process because they choose characters that are obvious and are not challenged by the necessity to make a decision on a character that may not be expressed strongly in their sample.

The weed mapping program has not been tested with local data.

DISCUSSION

Weed action and other groups have sprung up over the past decade in response to the effects that weeds are having on bush land and roadside vegetation and the

lack of control by government or landholders in these areas. Most of these people are volunteers, many have little weed science training and some are ideologically opposed to the use of herbicides. As a consequence, some of the weed control exercises have little long term impact. Extension aids for these groups need to address these issues. In 'Southern Weeds and their Control' botanical jargon has been avoided in the descriptions. Herbicidal as well as mechanical or cultural control techniques are included and an appendix with a few lines on each of the herbicides has been included. Where possible a recipe using commonly available, low toxicity herbicides as well as the most effective herbicides is included.

In 'HerbiKey', easily distinguished characters have been used and a diagram of the character appears in the list box where the user makes his or her choice. This is backed up by a set of photographs for the plant. Most users enter a few obvious characters to reduce the short list of weeds to ten or so and then flick through the photographs to determine the most likely candidate. This combination of keying and recognition is well accepted by those with little botanical training.

The weed mapping program aims to make available a lot of low level information on weed distribution to assist with decision making. As many of our weeds are poorly collected, it is hoped that the interactive nature of the map will encourage users to collect and submit specimens to the state herbarium in areas where they may have been present for decades but never collected.

Because the target audience for these aids tends to be volunteers or community groups the cost is kept to an absolute minimum by seeking government funding or sponsorship. The real value in these aids is expected to be an increased level of more effective weed control.

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