

final report

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Blue Heliotrope Biological Control

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What did the Group set out to do?

To have colonies of leaf-eating beetles (*Deuterocampta quadrijuga*) feeding and spreading on blue heliotrope infestations in Central and South East Queensland. Blue heliotrope is an invasive, toxic weed that has been spreading across the southern part of Queensland during the recent drought years. Producer interest in controlling blue heliotrope is very high.

How the project was done

This project was a follow up from 2002/Q04 which established a breeding colony of leaf-eating beetles in tubs of blue heliotrope in a glasshouse at DPI, Kingaroy.

The initial project had problems with a fungal pathogen killing the beetles before release, however by increasing the level of quarantine and sanitation it was felt that we had a good chance of minimizing a re-occurrence.

The tubs were emptied of all previous soil and plant materials, sterilized and heliotrope fragments collected from a different location and soil type in an attempt to minimize the re-introduction of *Beauvaria*. Additional quarantine and sterilization measures were also employed during the season. This approach was successful as the number of infected beetles was significantly lower than in two previous years of 2002/Q04.

It was hoped to have the beetles establish “nursery” sites in each district. Once the numbers at nursery sites have built up, the producers were then responsible for harvesting the beetles and further redistributing them in their own regions. As the beetles do not readily fly long distances, the transfer of beetles from site to site by the producers was an integral part of the success of this release program.

What was achieved?

- Several thousand heliotrope beetles and larvae were released.
- Fewer sites were selected and more beetles and larvae were put out each site to gain a critical mass for breeding.
- We now have four successful release sites at Duaringa in Central Queensland, Mt Perry, Crows Nest and Kingaroy in South east Qld. The site on red soil at Kingaroy has achieved success on what we considered to be a high risk *Beauvaria* site, as it was where we took the original soil and plant fragments. This is especially pleasing as this situation has the highest livestock mortality rates that I am aware of. This site was originally considered a failure so maybe other release sites will prove successful in the long term.
- One of hottest and driest summers on record has made the assessment of continued colonisation difficult. Finding release sites was difficult and we will have to wait until next growing season to assess the results on both the established sites and new sites.
- We found that the beetles fly further than we anticipated and so are hoping for a quicker natural spread, as collecting beetles and larvae in the field for distribution has not been as easy as hoped. Field collection of the required critical mass numbers has been more difficult than anticipated. It is much easier in a glasshouse with a “captive” population. When assessing a field population, first impressions are of many beetles and larvae, but when a collection of several hundred is required they are hard to find in the scattered heliotrope plants.

- Enthusiasm for the project is still high. I have secured funding to continue the project for another year. The Kingaroy Landcare Group and Brisbane Valley Landcare Groups will contribute funds, as both of these groups have rated blue heliotrope as a significant weed. The Animal Research Institute in Brisbane is assessing the impact of pyrrolizidine alkaloids from blue heliotrope on meat quality and is also making a contribution to the beetle breeding project.
- The success of this project remains a high priority amongst producers. Producers, who are not involved in the project, make contact seeking information, so word of the projects activities is spreading amongst the grazing community.

Beetle release

Approx 2500 over 4 sites at Kingaroy, Brisbane Valley and Crows Nest making a total of over 7500.

Viable colonies

At this stage we have 4 viable colonies at Duinga CQ, Kingaroy, Mt Perry and Crows Nest.

Beetles as part of a BH control program

You cannot plough BH out and then plant a pasture as it will reshoot from great depth and gain significant recruitment from seedlings. BH can also be a problem weed in annual crops, so a long cropping phase is needed to have a significant impact. Spraying is rarely cost effective, if cheap herbicides are used no residual control is achieved and the stand will quickly regenerate from seed. BH also infests many areas that are impractical to spray.

Manipulating pasture growth to suppress BH is difficult. BH will grow and survive in a fairly dense sward. It will "wait" until a drought period and then recover quicker after rain than most other plants.

So the BH beetle provides one of the few opportunities to have a significant impact on BH in pastures. At this stage, the aim is to use the beetles to reduce the seasonal BH biomass by 50 to 75% and significantly reduce seedset. Thus the beetle will be part of a management program to have an "acceptable" level of BH remaining in the pasture.

Comment

This project and its predecessor were probably not successful, if analysed strictly under the PIRD guidelines, as we did not meet our goal of engaging groups of producers, in different areas, breeding and distributing blue heliotrope beetles.

I believe the fungus that devastated our breeding colonies and the continued drought were the main reasons that we did not succeed. Also, in retrospect, our time frame was optimistic – a 3 to 4 year initial time frame would have been more appropriate for a beetle with its life cycle.

On the positive side, this weed is considered a real problem for many graziers and interest in the breeding program has been very strong. I felt guilty every time I had to turn someone away as we could not supply even a small number of beetles for them. We obviously had "the product" it was just that the delivery system let us down. The producers associated with this project were keen to be involved in the planning, and we had good attendance at working bees.

Should PIRD fund this type of project in the future?

Producers see a direct and tangible benefit from controlling weeds using a biological agent. It is something they can relate to on their own property and be introduced at relatively minor cost. Producers are very willing to get involved with a project of this type. It is very easy to get "too many" in the initial stages as not enough beetles can be supplied to gain a critical mass.

Having the support of an agency to supply ongoing labour is important in this type of project. Farmer groups can fabricate breeding cages and associated protective structures, but providing the ongoing labour would be an issue for most groups.

PIRD should fund biological control distribution projects provided there is an agency involved and the "collection" system is relatively easy to provide critical mass numbers per site.

Producer Comment

Although a little sceptical at first, last summer I had a new appreciation and was re-invigorated as to the merit of this project. At first, as you know, we pegged out areas and watched with anticipation to see them multiply, but were very disappointed to see numbers dwindle daily. After a number of occasions doing the same exercise I was becoming disillusioned as to the success of the project. We thought the birds were taking them (given the beetle is a fairly reasonable size), but after setting a shade house in place to combat this problem, we then created a new one with other insects. But low and behold, last summer we set up another open site with a trampoline as cover over a small area of the heliotrope and watched daily. As the heliotrope was thick where we released the beetles, and the surrounding close proximity was quite sparse in this contour, it was extremely easy to see the migration to other plants outside the zone. After further inspection in other contours of the property, we found thousands of larvae feeding on heliotrope which was under the canopy of an old forage crop. We then looked closer around the property and found larvae scattered throughout the property feeding on heliotrope. Neighbouring properties to ours were also benefiting from the explosion in numbers. Obviously earlier trials where we thought we had failures, this was not the case. We primarily run cattle on this property. We have not been disadvantaged from the release of beetles. Although we have been mindful of locations where we have released beetles, we have not changed the way we have generally farmed the property. Even if we plant a crop of forage, a good crop of heliotrope seems to grow as well, so the beetles have a constant supply of food. I am looking forward to the warmer weather to see how much further the beetles have traversed around the property. I would think over the next couple of years, we will really see the impact these beetles have made. Norma and Dan Pedler operate several properties in the Kingaroy district

I can only comment from what I have seen on other properties in the Emu Ck. area. Blue Heliotrope on some properties has completely taken over pastures, particularly on previously cultivated soils. It is too expensive to spray these large areas so a biological solution is very attractive. We have released bugs for three years now but there has always been some impediment to their success. First year we had a disease problem in our bug breeding facility. The following two releases have coincided with very dry conditions. One site reported bugs carrying over from one year to the next but on other sites they have not been seen again. Where the bugs are first released there is good activity but they must carry over to be effective. The serious nature of the weed encourages us to continue with the trial hoping the bugs do get a fair run season wise so they may be able to establish permanently.

Bob Rowlings