

Misbehaving plants

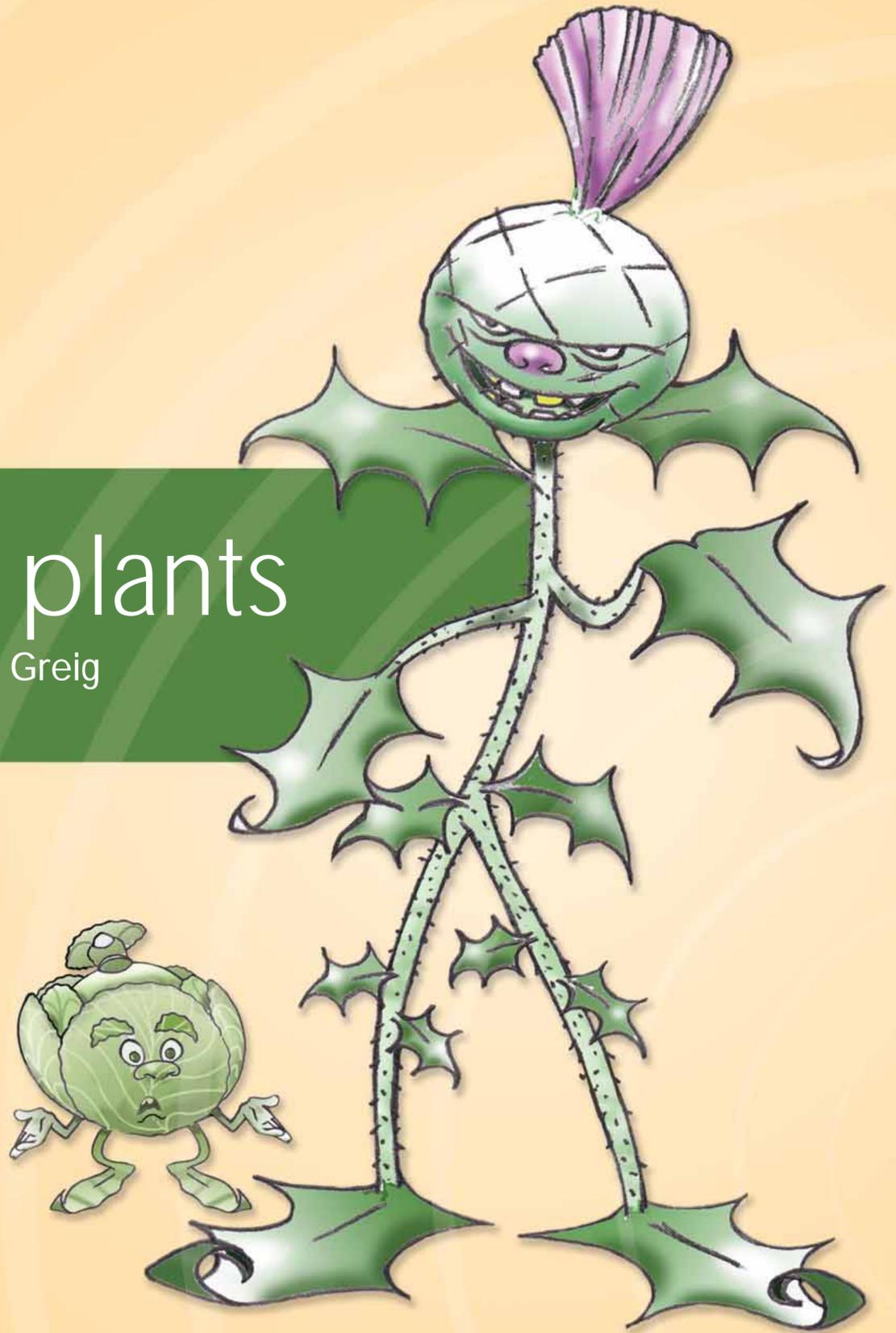
Developed by Susanna Greig



Illustrated by Malcolm McGookin

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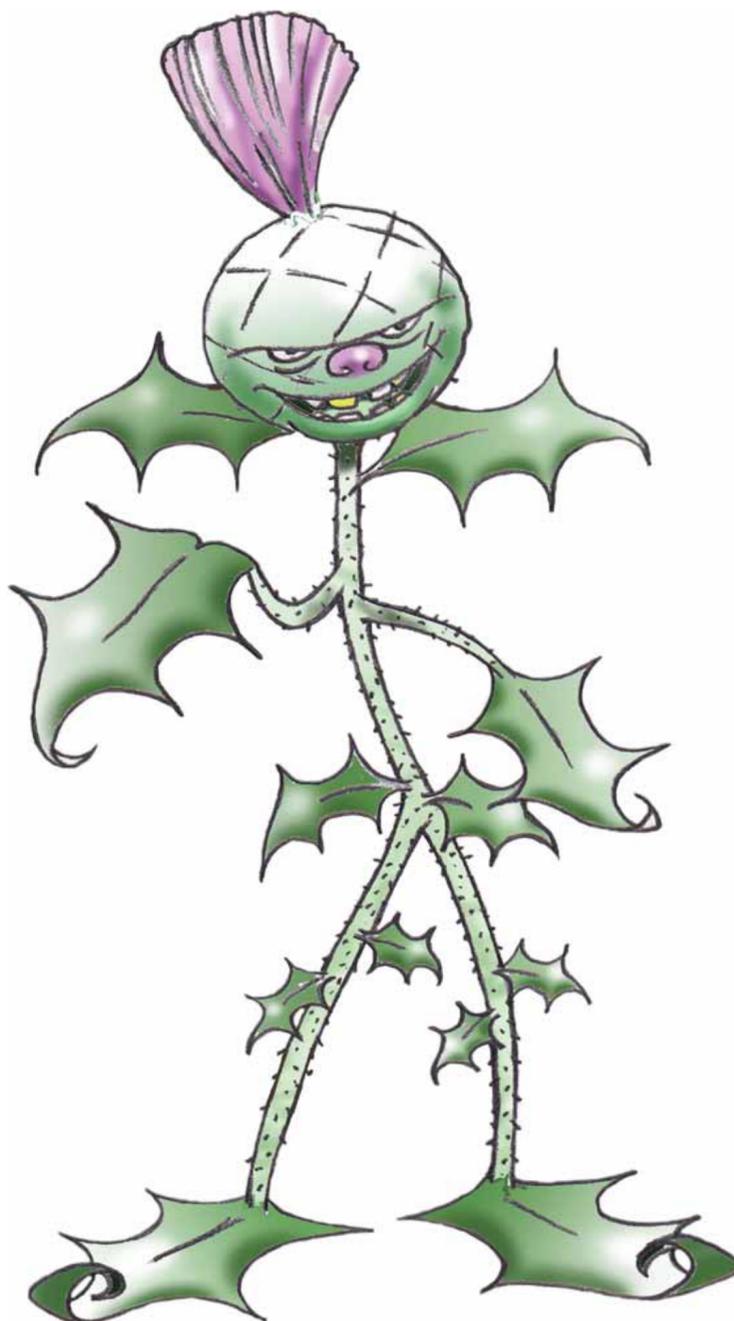
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What are weeds?

- » Weeds are plants growing in the wrong place at the wrong time.
- » Weeds are plants, which grow where we don't want them to grow.
- » Weeds cost money and take time to remove.
- » Weeds can be harmful to people, animals and other plants.

There are many different types of weeds.

Some weeds have funny names.

This plant is called 'fat hen'.



Some weeds are harmful to animals.

This plant is called 'bellyache bush'.



Some weeds look pretty.
This plant is called 'lantana'.



Some weeds look mean.
This plant is called 'saffron thistle'.

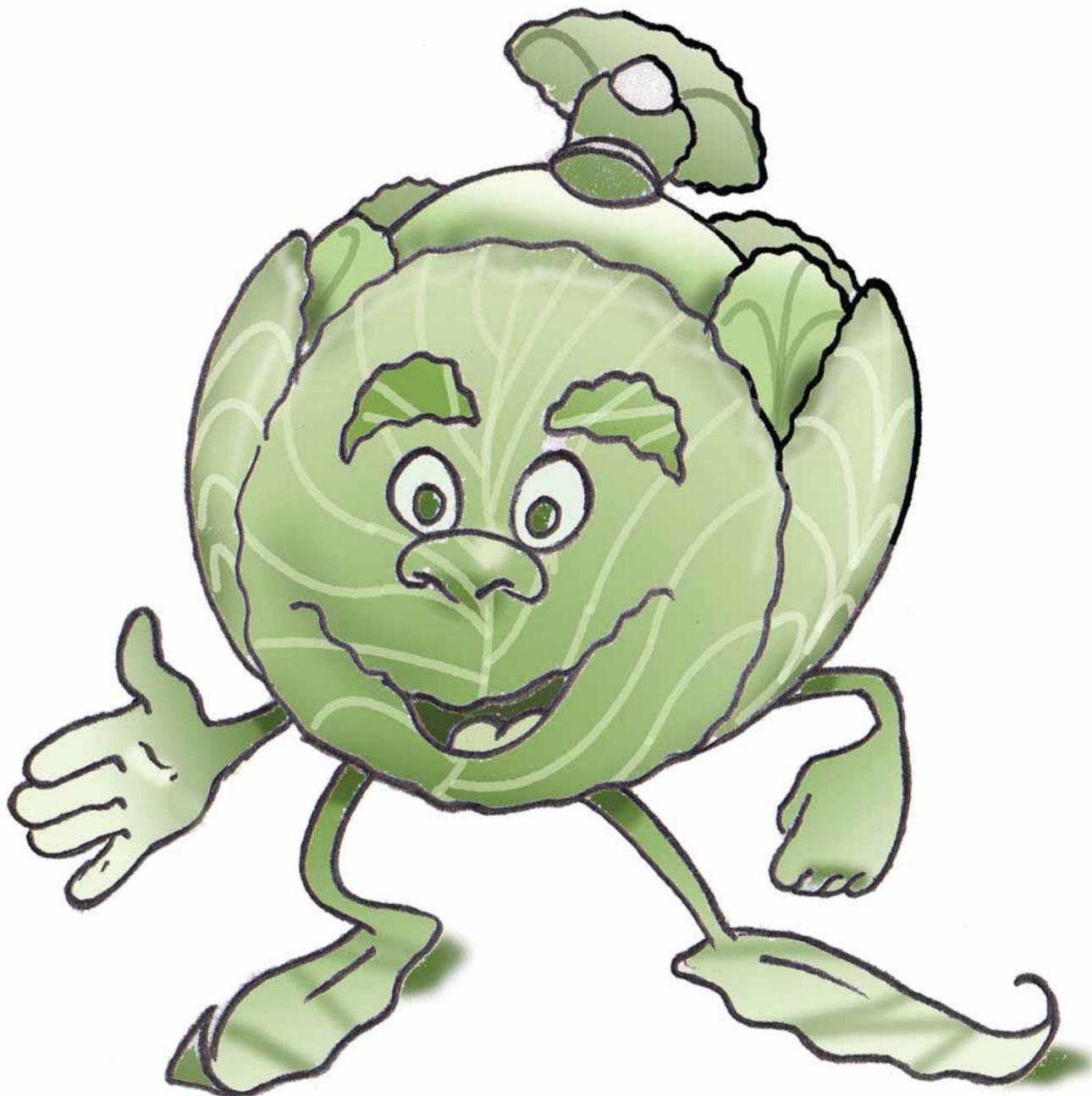


Some weeds have tasty fruit.
This plant is called 'blackberry'.

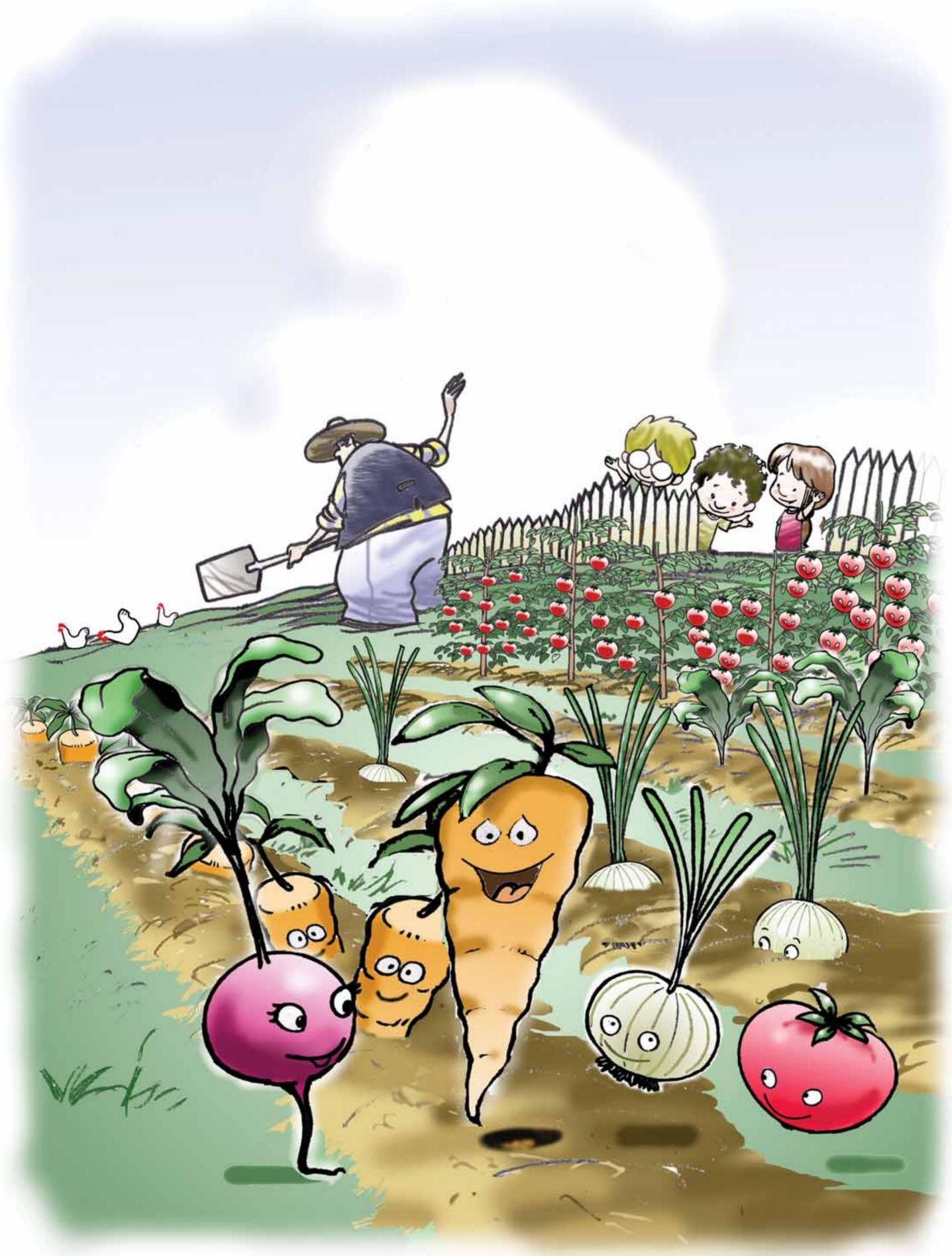


Some weeds smother other plants.
This plant is called 'rubber vine'.



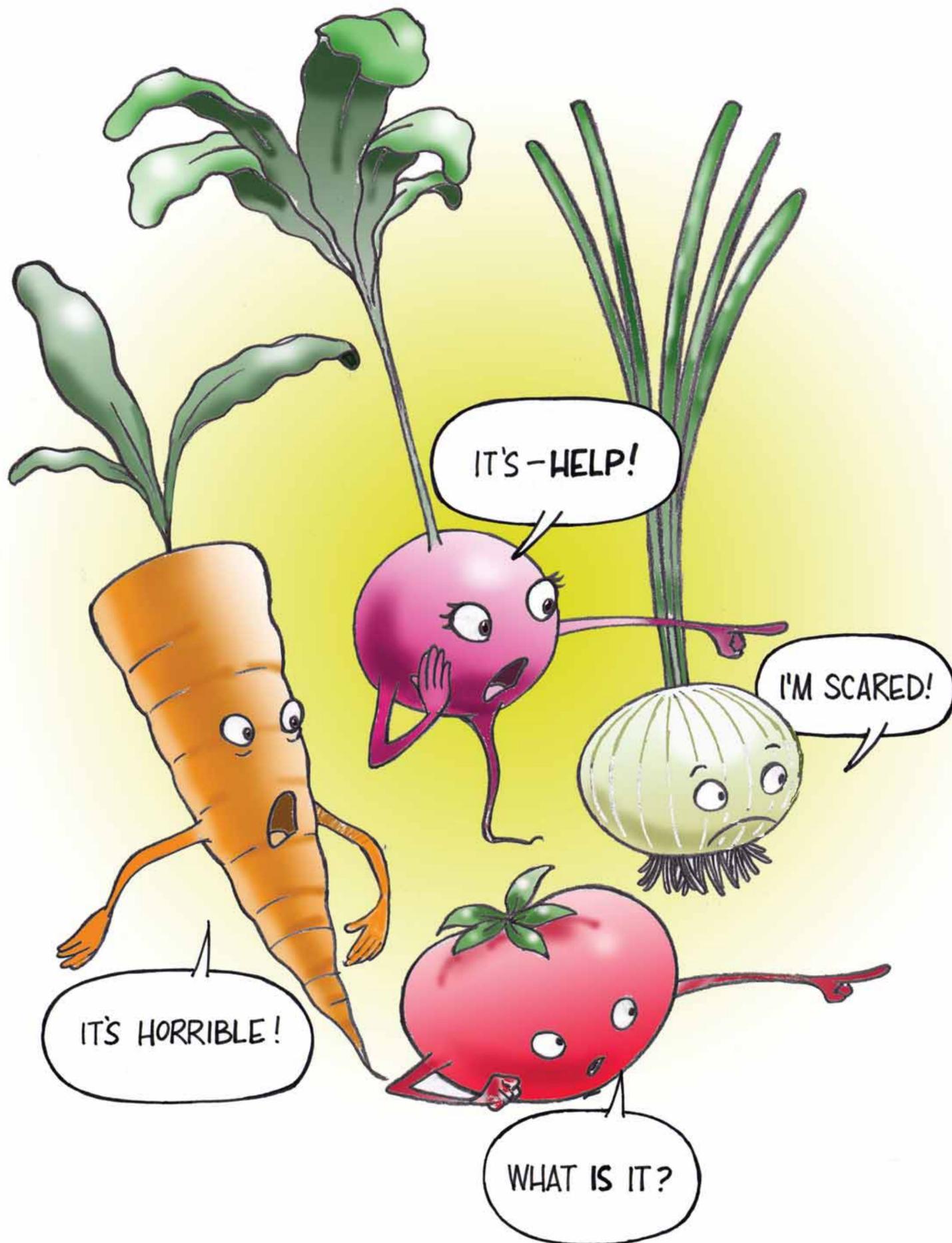


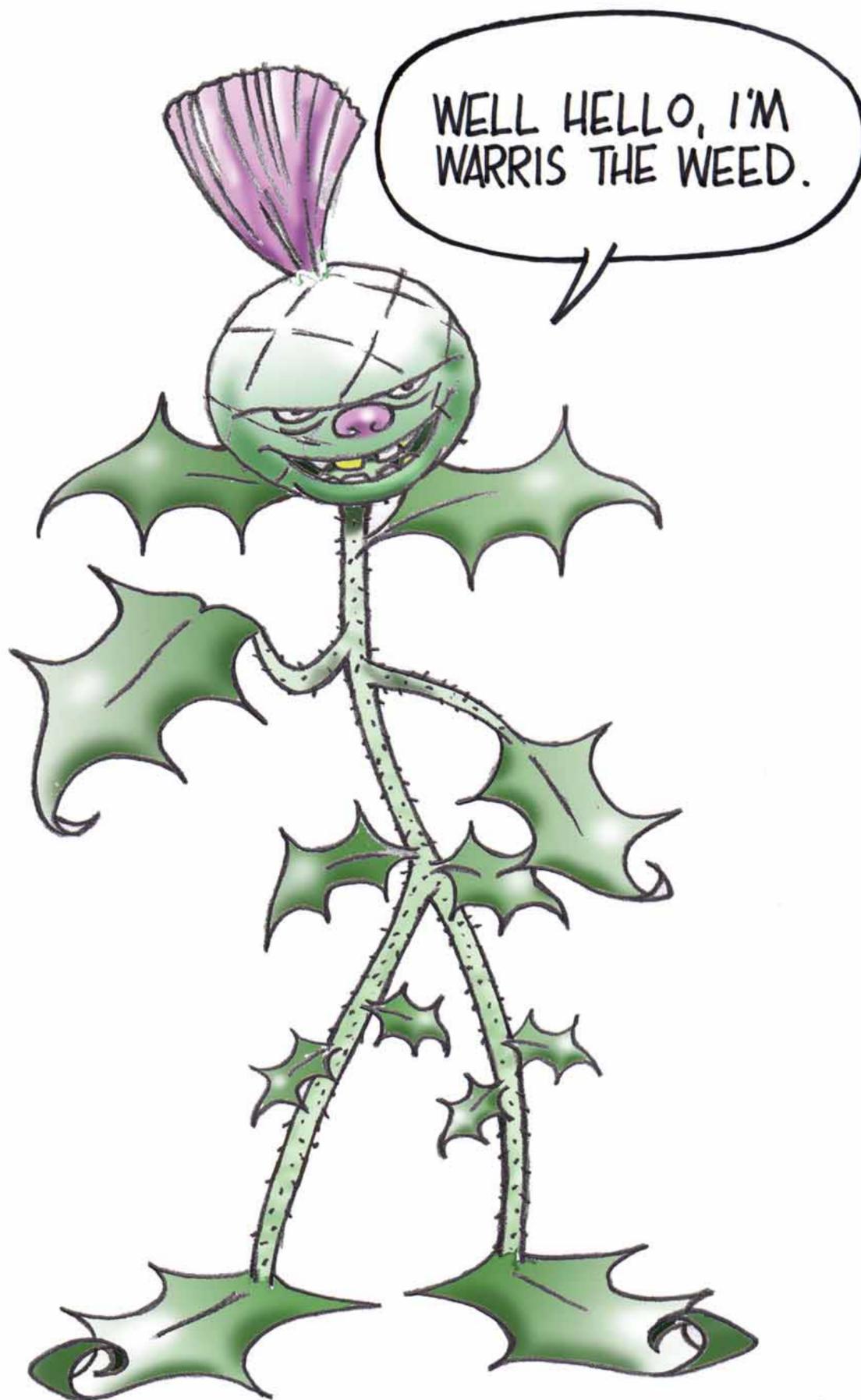
Hi kids! Captain Cabbage here to tell you about weeds! Let me tell you, those guys are a bunch of double bad dudes! I mean it. Weeds – no one needs. That's what I say. I have seen the damage they can do. It happened like this...



My mates and I lived happily in old Mr Jones' garden. He kept things 'tip top'. We shared our needs. We didn't even know what weeds were. We thought it would always be this way. But then...

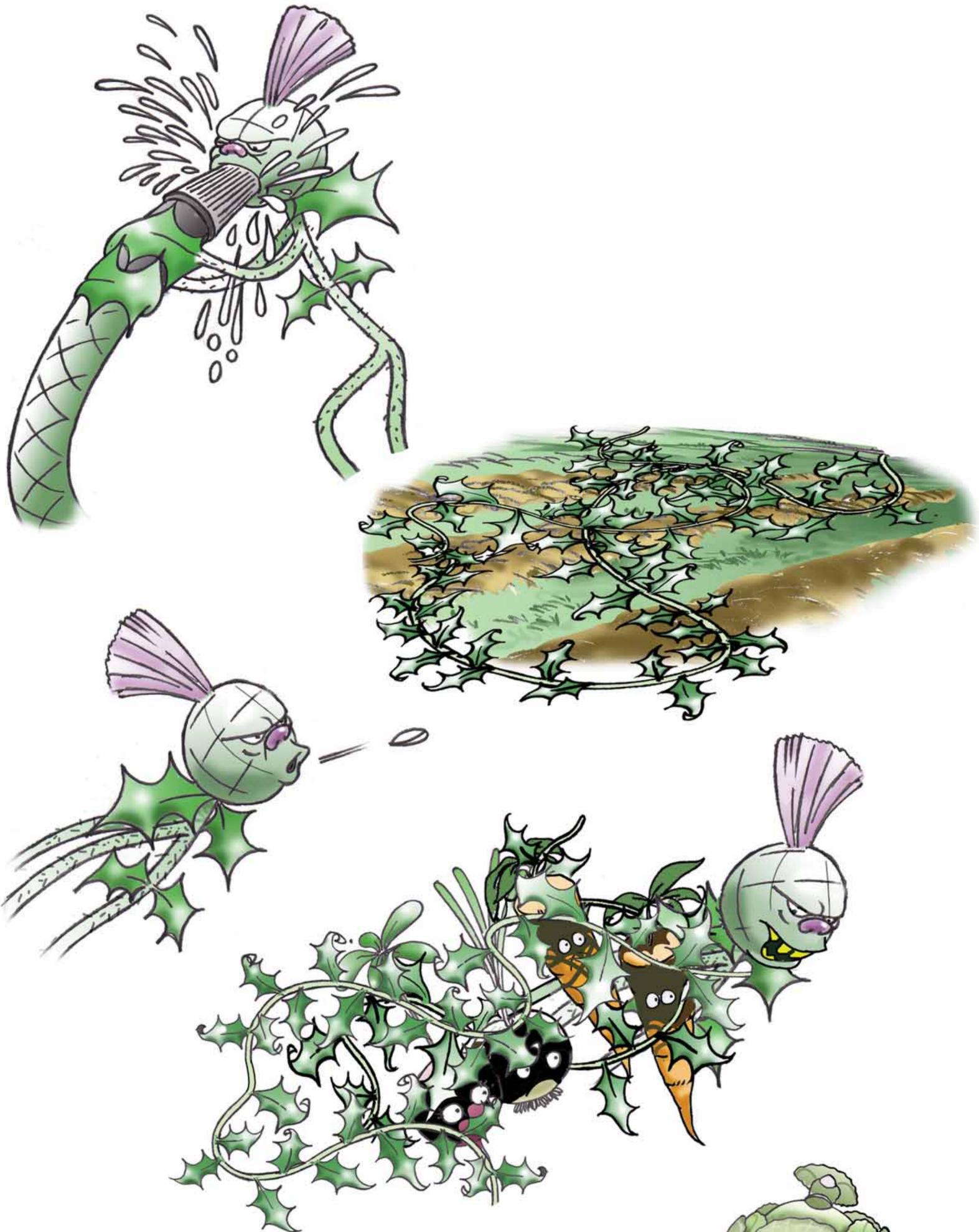






We had an uninvited visitor.
Things got really bad!





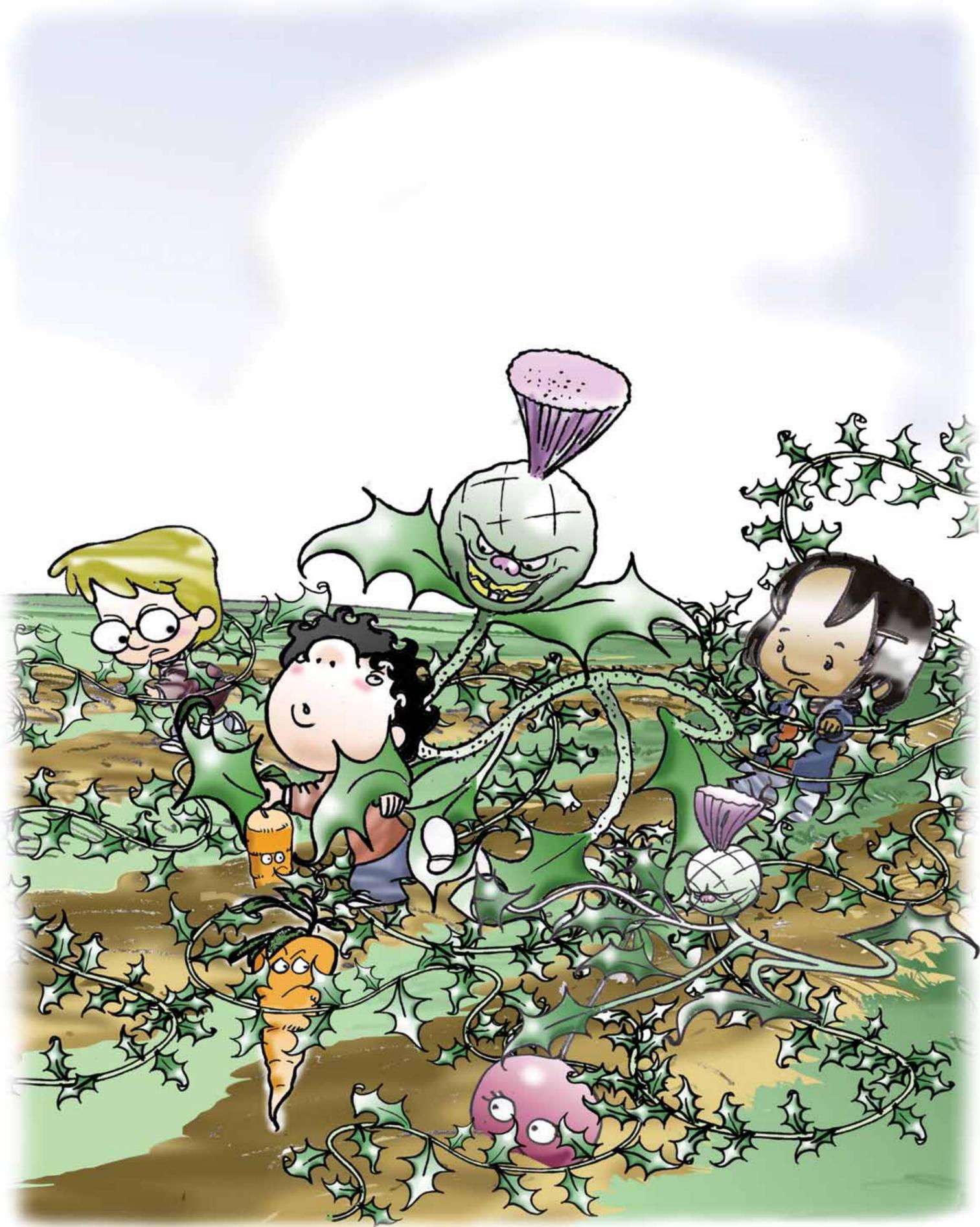
This wicked weed guzzled all our water!
It sucked out all the food from the soil.
It spat seeds. These seeds spread
everywhere. Everywhere! It smothered
us and we couldn't see the sun.





It would have been the end of us if those children had not come along.





They pulled and yanked Warris away. It was hard work. Warris and his gang put up a fight.

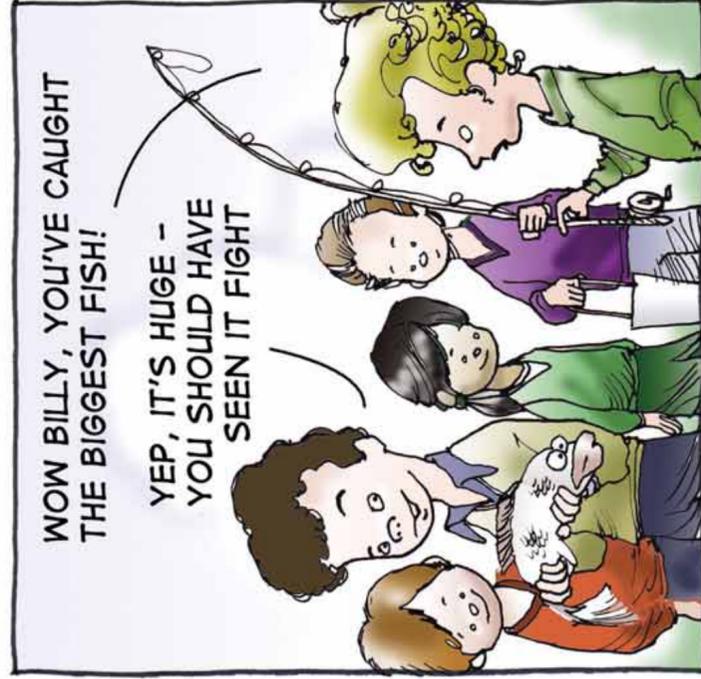




It was a relief when those kids had a win! Remember; weeds – no one needs!



Can we cause weeds to spread?



This is Noogoora burr.
The seeds of this weed are found inside the burr. Look at the shape of these burrs. Did you know that Velcro was invented by George de Mestral after he noticed the shape of burrs that stuck to his dog's hair? Burrs are designed to attach onto moving objects and this is how their seeds travel to new places.

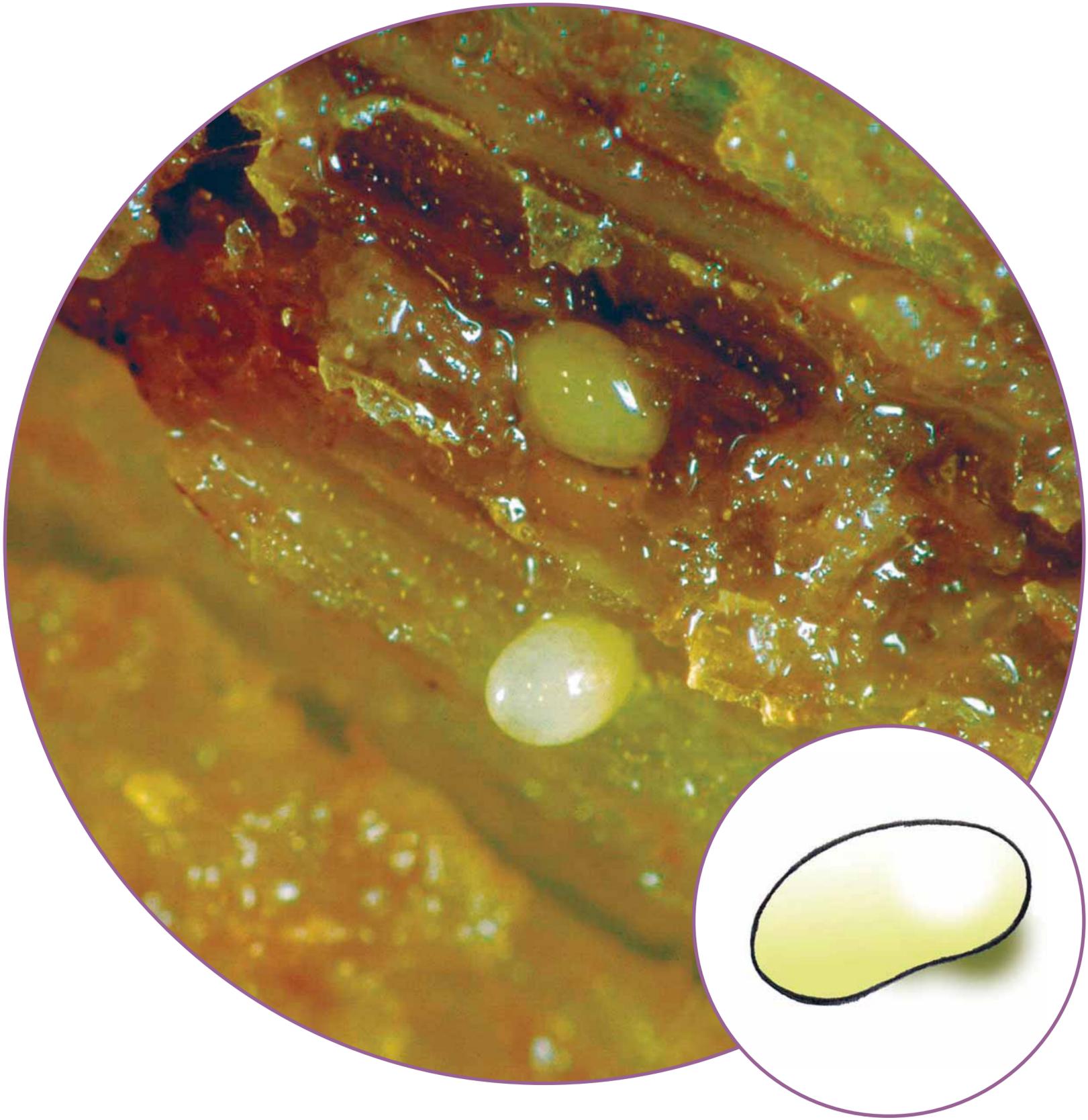




Water hyacinth is widely recognised as the world's worst aquatic weed. It forms dense mats that float on water and choke river systems. This photograph was taken at Taway Lagoon, Papua New Guinea, in February 1994. Do you think there is anything that eats this weed?



This photograph, taken in August 1997, is at the same location after a biological control was used. Where has the weed gone? Water hyacinth can be successfully controlled by a variety of insects. We will investigate the water hyacinth weevil, or as it is known scientifically, *Neochetina bruchi* (neo-ket-in-a brook-eye). Let's find out how this weevil can help us fix the water hyacinth problem.



Can you see us? We are the eggs of the water hyacinth weevil. We are laid inside water hyacinth plants.

Q1. How big is the water hyacinth weevil egg?

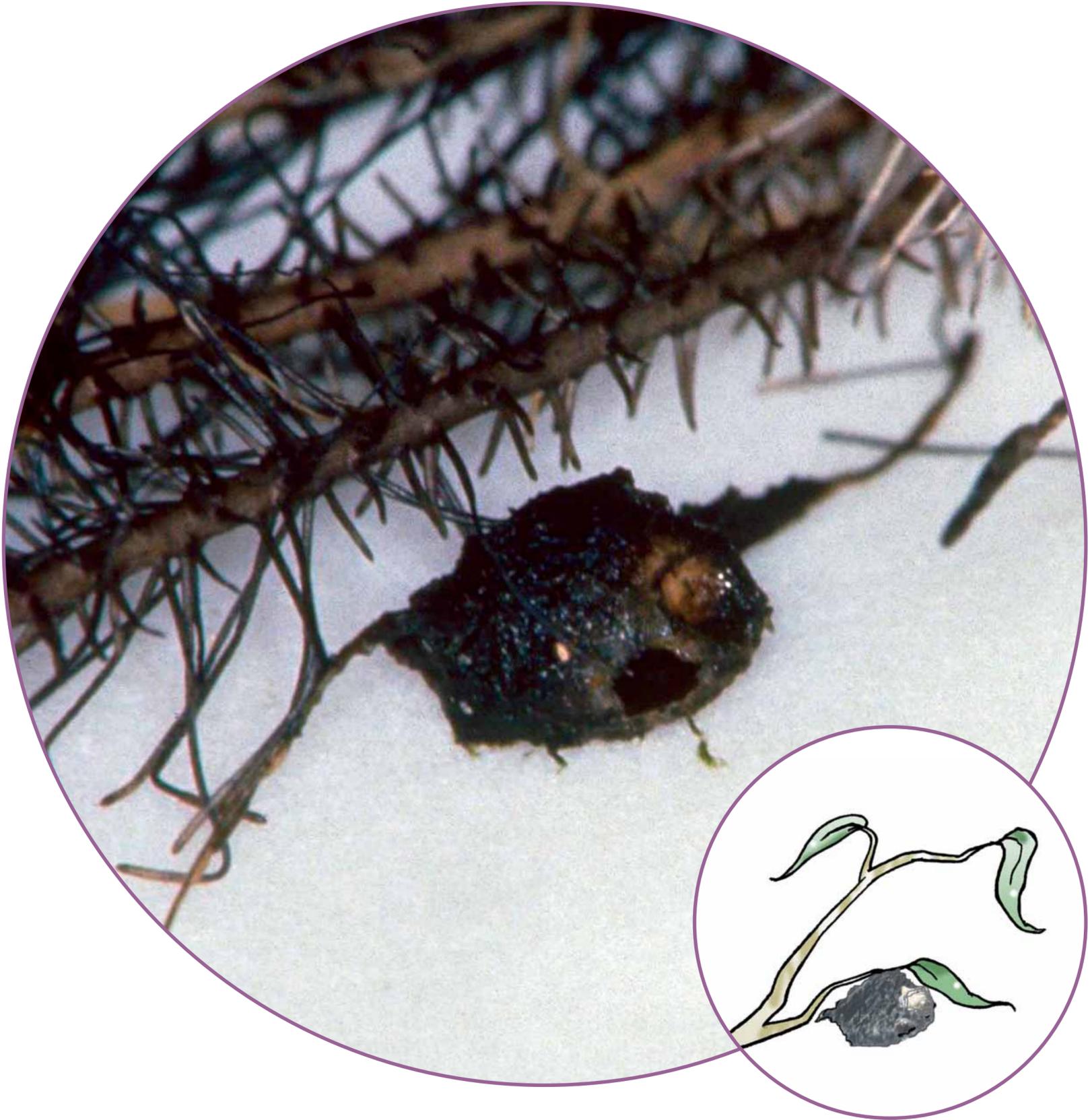
Q2. How do the eggs get into the water hyacinth plant?



Look at me now! I am the larva of the water hyacinth weevil. I have hatched from the egg but still live inside the water hyacinth plant.

Q1. What is the size of the water hyacinth larvae?

Q2. How do the water hyacinth larvae damage the water hyacinth?



Do you know what I am? I am the pupa of the water hyacinth weevil, but you can't see me because I'm inside my cocoon. The pupa is the growing stage between the larva and adult weevil. If the pupa was human, this stage would be called the teenage years.

- Q1. How and where do the pupae form?
- Q2. How big is this pupa cocoon?

A1. The fully grown larvae leave the crown or central growing part of the plant and move to the roots under water. Here they build a dark, circular cocoon from small broken root hairs and attach the cocoon to one of the larger roots.
 A2. On average the cocoon is about 2mm in diameter.



I bet you can see me now! I am the adult water hyacinth weevil.

- Q1. How big is the adult water hyacinth weevil and when is it active?
Q2. How do the adult weevils damage the water hyacinth plant?

Cover and contents page

1 Predict the type of book

Before reading the book with the children, ask them to look at the cover, read the contents page and then predict if the book will be a fictional story, a non-fiction/reference book or a combination of both. After using the book, revisit the predictions and confirm that this is a book containing both fictional stories and non-fiction information with weeds as the subject.

What are weeds?

1 Determine the children's current understanding of weeds

Before reading this section, ask the children if they can explain what a weed is. Encourage the children to explain where they may have seen weeds and why they think these plants are weeds. Then, as a class, read 'What are weeds?'. This defines weeds and illustrates different examples, helping to confirm or clarify the children's ideas.

The wicked ways of Warris the Weed

1 Discuss the story

In a talking and listening activity, discuss the story. Encourage the children to offer their ideas and to support these ideas with reasoning. To initiate discussion ask opening questions. These could be:

- Describe the appearance of the veggie garden at the beginning of the story. What did you expect might have happened? Is this different from what did happen?
- How were the other plants affected by the presence of the weed?
- What do you think may have happened if the children in the story did not notice the weeds growing?

2 Sequence events in the story

Photocopy the pictures in the story and cut them out. Children could work in pairs to sequence the pictures telling the story. Alternatively, or in addition, photocopy and cut the words from the story into sentences and guide the children to sequence the sentence strips.

3 Identifying the stages of a narrative story

This story has a setting, a complication and a resolution. With the children, identify the different stages of the story. To reinforce this, encourage the children to draw the characters and the events at each stage.

4 Recount the events at the veggie patch

Guide the children to develop a story describing the events at the veggie patch. This recount could be told through the eyes of Mr Jones, one of the vegetables or Warris the Weed. The recount could be developed independently by the children or together as a group.

5 Identify different points of view

Ask students to imagine that they are the characters in the story and discuss the different viewpoints at the different stages of the story. Children will discover that their ideas may not be the same as others and that readers develop different interpretations of the same stories.

6 Role play story

Guide the children to develop a backdrop of the veggie patch by painting on some butcher's paper or old material. Children can then use scrap materials to make the characters in the story. The characters could be represented as objects or puppets. Using the characters the children have developed, they can then act out the events of the story. Alternatively, children can work together in small groups to mime different stages of the story. The rest of the class can guess which part of the book is being mimed (it will be important to explain and demonstrate that a mime – a form of drama – involves non verbal communication through action and gesture in minimal space).

7 Create a veggie garden

Design and develop a real veggie garden that the children can maintain. Developing and caring for this garden provides opportunities for children to: develop an understanding of the needs of plants; observe how plants change as they grow; learn to care for other living things; and discover the problems presented by weeds and the need to control them. This activity will provide opportunities for extension. The children could investigate the natural mineral and nutrient cycles occurring in the garden. Perhaps you might like to explore with the children the factors that make a garden sustainable. This could include developing a worm farm, or creating a compost heap from the class' lunch time food scraps.

8 Write a procedure for developing a veggie garden

This activity will be best done after children have physically developed a veggie garden.

As a class, discuss the steps associated with developing a veggie garden. Guide the children to jointly construct a procedure for developing a veggie garden. The procedure should list materials required and the steps taken to prepare the soil and the garden beds, to plant seeds and to care for and monitor the garden. The procedure should be written as clear directions that could be easily followed. Alternatively, guide the children to develop their own procedure which could be a series of pictures, or photos taken as the veggie garden is constructed and sequenced in the correct order to describe the actions completed.

Can we cause weeds to spread?

1 Investigate Velcro

Bring in some Velcro and allow children to feel and observe the way Velcro works. Discuss the invention of Velcro (as outlined in the book) and the way burrs are similarly shaped to grip onto moving objects.

2 Watching weed seeds sparkle as they move to new areas

- 1 In an area of the playground where glitter can be seen and easily removed by sweeping (this could be along a dark path), make a solid line of glitter (a 4cm by 50cm rectangle or larger is best).
- 2 Organise children to step in the glitter. Then challenge them to see how far they can walk, taking the glitter to new areas (very slightly damp soles of shoes are helpful).
- 3 Explain to the children that the glitter is like weed seeds which can travel to new areas on our shoes and clothing.

3 Collecting seeds and/or plant parts in a sock walk in the playground

- 1 Ask the children to bring to school a large old fluffy sock which fits over their shoe.
- 2 Allow the children to put the sock over their shoe and to walk in an area of the playground where many seeds or plant parts can be found. It is important for the success of this activity that the teacher takes the time to investigate the playground to determine the best location before doing this activity.
- 3 After walking and collecting seeds or parts of plants, have children remove the sock from the shoe and carefully carry it without dropping the collected items to an outside area near the classroom. Investigate with the children what they have collected in their socks. Relate this to weed seeds collecting on people's shoes and clothing and how easily weed seeds can be brought into new areas.

4 Children make decisions and offer reasoning as an introduction to forming an exposition/argument

- 1 After reading the comic strip as a class, explain to the children that this story illustrates a situation where humans can spread weeds.
- 2 Ask the children to imagine that they are those who went fishing. Discuss the two options: remove and carefully dispose burrs containing weed seeds before leaving the weedy area; or leaving the burrs in their clothes and carrying these into new places.
- 3 Allow the children to form an opinion regarding what they think is the best option.
- 4 Have the children stand along an imaginary line from one end of the room to the other. Explain that one side of the room is to support the first option, while the other is to support the second. The position where the children stand should represent their opinion.
- 5 Encourage the children to explain the reasons for where they have chosen to stand.
- 6 Discuss the different interpretations of the cartoon and the different viewpoints.

Extend this by asking the children the following question:

What do you think are some things we can do to avoid spreading weeds? Ideas may include:

- washing down vehicles after they have been in weed infested areas (especially the tyres)
- carefully disposing garden wastes and avoiding dumping the waste into bushland
- removing water weeds from boat motors after they are used in weed infested rivers to avoid these weeds being taken to new places.

5 Finishing the cartoon story

- 1 Encourage the children to draw their proposed ending or the next frame of the story.

Weed munchers – biological control of weeds

1 Introduce biological control

Discuss with the children the following ideas about biological control.

- Biological control of weeds involves using natural enemies such as insects or diseases to limit the growth and spread of the weed.
- There are several other insects used to control water hyacinth and many more weeds can be managed using biological control.
- Biological control is best used together with other weed management techniques because alone it will not usually eradicate a weed population. This is because the biological control agents (insects or diseases) become less effective when supplies of the weed are limited. In the case of water hyacinth, biological control has been successful when it has been the most significant component of an integrated approach.

2 As a class read the information about the water hyacinth weevil

Follow the changes in the life of the water hyacinth weevil as it chews its way through the water hyacinth. Allow the children to discover the additional 'Do you know' facts provided by reading the questions and turning the book upside down to learn the answers.

3 Design and make an insect responsible for slowing the growth and spread of a weed

Using scrap paper or other appropriate materials, guide the children to design and make an insect responsible for attacking weeds as a biological control agent. The children may decide to make an adult or a larva of the water hyacinth weevil or design their own insect with huge teeth and other adaptations to keep the number of weeds at a low level.

4 Investigate the lifecycle of the water hyacinth weevil

Explore the lifecycle of the water hyacinth weevil with the children as it hatches from an egg to a larva, then pupates into a weevil. This activity could include:

- guiding the children to draw a life cycle diagram illustrating the different stages of the water hyacinth weevil
- comparing the changes in the lifecycle of the water hyacinth weevil with other insects, with which the children may be familiar
- as a class developing a 'size graph' which illustrates the relative sizes of the different stages of the water hyacinth weevil.

5 Allow the children to reflect on and consolidate what they have learnt about the biological control of weeds

Prepare a table on the board or on butcher's paper to record the children's responses to the following questions:

- 1 What have I learnt about biological control of weeds?
- 2 What else would I like to learn about biological control of weeds?

After recording the children's responses, discuss the different ideas and expand the discussion according to what the students would like to learn.

6 Organise for you and your students to become involved in a Weed Warriors program

Weed Warriors is a program allowing students to become actively involved in the management of a local weed problem whereby they join with local weed officers, land managers and community groups to implement a biological control program for a regional priority weed. Together they plan, act and evaluate solutions to weed problems, greatly contributing to the stewardship of the local environment. The Weed Warriors program generally lasts 4–6 weeks. Throughout this time, program participants are taught the skills needed to breed, release and monitor the impact of the biological control agents through the provision of resource material and through active participation in the process. For contact details and more information about the Weed Warriors program visit the Weed Warriors website: www.weedwarriors.net.au

A word to teachers

Weeds are one of the greatest threats to the environment and agriculture in Australia and yet many people know little about them. This big book is an initiative of the Cooperative Research Centre for Australian Weed Management to develop greater awareness of weeds amongst the younger generation in schools today. It offers information on weeds in alternative formats, allowing flexibility in teaching and catering for children's different styles of learning. Suggested lesson activities at the end of the book provide opportunities for teachers to introduce various types of texts including narrative stories, recounts, procedures and expositions or arguments.

