

# Bug juice hits the spot

No one's sure how this natural brew works, but it does

by Robin Day

These pesticides are the hottest thing in gardening! Making and using bug juice has been discussed a lot in *Organic Gardening* magazine in recent years. According to Rodale's *Encyclopedia of Natural Insect and Disease Control* (edited by Roger P. Yepsin, 1984), the U.S. Department of Agriculture in California was telling people how to make bug juice back in 1960. The Canadian Gardener television show, based in Vancouver, discussed this topic in July.

## HOW TO MAKE BUG JUICE

- Gardeners are told to hand pick the worst pests in their garden, especially those pests that look unusually slow and might be diseased, for example: Cabbage White caterpillar or Potato beetle grubs, slugs, aphids (on the whole shoot).

- Place them in a bottle with water and some drops of detergent or soap and a teaspoon of salt or sugar (the formulation is imprecise as yet).

- Pulverize with a mortar and pestle or in a blender. (Joke: borrow your neighbor's blender!)

- Filter out all solids with an old nylon stocking or cheesecloth.

- Dilute with more water in a spray bottle and apply to your valued plants as you would a regular insecticide solution. Unused solution must be kept in the refrigerator and shaken well before use. Dispose of old solution (more than about five days old) in the garden because it's like a homemade sauce or stew, without preservatives, and it won't keep indefinitely. You might try freezing leftover juice for use in the following spring.

- Your garden pests should now become insignificant if you continue to apply fresh "bug juice cocktail" throughout the spring and summer.

## HOW DOES IT WORK?

Now just what's going on here? A look at the sources above, and what follows, will show that no one is certain how bug juice works. A number of the following ideas have been raised in other magazines and books, some have not.

**Disease:** Some of the blended insects are already diseased or parasitized (fungi, bacteria, viruses, protozoans, nematodes). These organisms, released into the solution as the blender pulverizes the insects,

cause infection by contact or ingestion when sprayed on plants and pests. This is homemade biocontrol. Commercial formulations with bacteria, viruses and nematodes already exist.

**Antifeedants:** These are chemicals that turn off an insect's feeding behavior like a key in a lock. They are not much talked about in the garden literature but chemists and insect physiologists think they are a new high technology tool for protecting vegetation (like protecting spruce and fir trees from budworm). I played a small role in a study of antifeedants at the Maritime Forest Research Centre, Fredericton, in the early '80s.

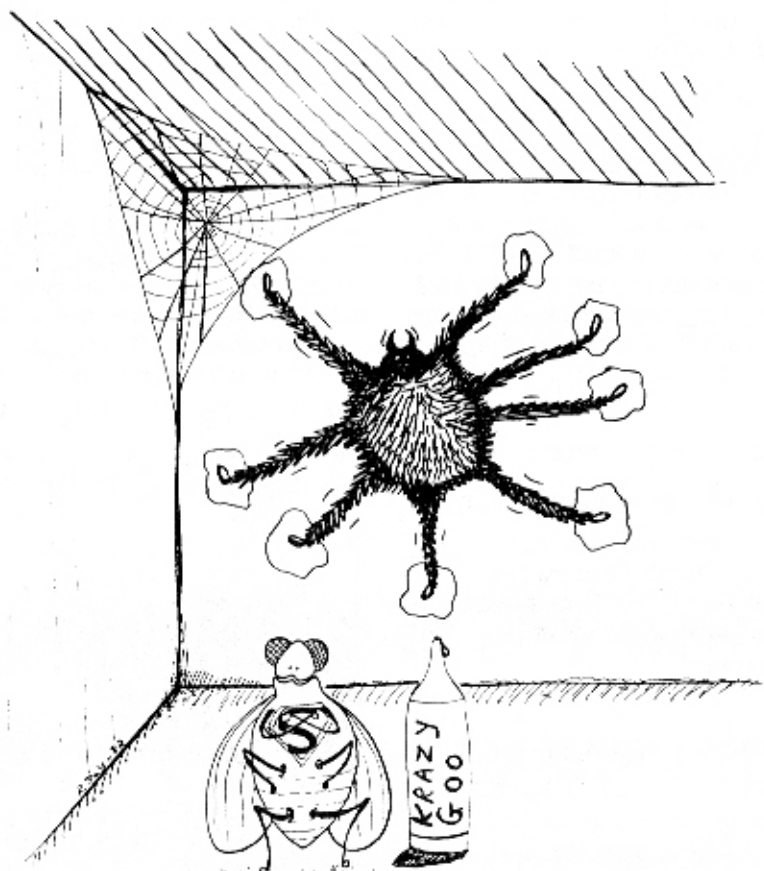
Maybe bug juice contains antifeedants in the cocktail. Spray these antifeedants on your valued plants and thus turn off the pest's feeding response.

**Repellents:** Many insects have smells or tastes (i.e., chemicals) in or on them that prevent their fellow species from

cannibalizing them. Some of these chemicals in bug juice may repel insects but not turn off the feeding response entirely. These chemicals would best be called repellents and not antifeedants (entomologists use more technical terms). The insect just crawls or flies away and feeds elsewhere.

**Immunity response:** Spraying bug juice on plants may actually set up a type of allergic or immunity reaction in the plants thus stimulating the production of the plant's own defences such as natural poisons and repellents (rotenone, phenolic oils, terpenes, pyrethrum, neme, etc.). There is good evidence that this does occur. For years now some fruit trees in Britain have been vaccinated against fungal blights.

Most of the research on these subjects is being done in universities and government labs — mostly American, as the money, will, and commitment has dried



(From *Cartoons Et Cetera*, Robin Day cartoon.)

up in Canada. With so much economic insecurity, researchers (including students) are more concerned with their pay-cheques and less concentrated on and dedicated to such esoteric pursuits.

The interested amateur can pursue these ideas at home in the kitchen, gardens, mini-lab or workshop. Testimonials say bug juice is effective in reducing pests in the garden. New formulations must be tested and, as scientists say, "modes of action" investigated and made clear.

#### OTHER TASTY BEVERAGES

**Plant juice:** As mentioned, plants produce their own repellents and poisons and these are used as defence against large and small herbivores as well as fungal and bacterial disease. Many of these chemicals have been bred out of domestic plants because they sometimes confer a bad taste to human consumers. Gardeners can augment a plant's natural chemical defences by spraying them with blended plant juice made from a pungent plant. Mints are pungent, as is cedar, spruce, thyme, chili pepper, orange peel and garlic. Ferns are loaded with chemical nasties. Japanese and Giant knotweed (*Polygonum cuspidatum* and *P. sachalinense*) grow in Atlantic Canada and their leaves are reported to have anti-mildew properties so plant juice from these may protect lilac and honeysuckle from their mildew problems.

Again I suggest you run several trials and develop your own effective plant juice cocktails. A bit of vegetable oil in the blender will help stick the mixture to your flowers and vegetables. Share your best recipes with RD readers.

**Masking agents:** Plant juices can disguise the normal scent or taste of a plant

and thus confuse potential pests. For example, if you spray carrots with garlic or orange peel juice, you can confuse the Carrot Root Fly. Note there will be a risk of spreading plant pathogens so it's probably best to avoid spraying plants with the juice of a close relative, for example, potato and tomato, both in the family *Solanaceae*. This is another topic for researchers.

**Seaweed juice:** Extracts from seaweeds (for example, kelps and *Fucus*) are becoming popular with keen gardeners. These alginates (from the word algae) are usually sprayed on plants in dilute form and they were traditionally incorporated into the soil. Yes, working seaweed (and eel grass "Zostera") into the garden soil is nothing new. Coastal farmers have been doing this for centuries as a topdressing or as composted material.

Gardeners and farmers have always thought this was a good source of organic matter, major nutrients and ocean micronutrients but it is now known that other things are involved. Alginate sprays are thought to have a vitamin-like effect and the long-chain hydrophilic polysaccharides help retain water in the soil and plant. This type of plant juice may be protecting plants from pests by boosting general health or by more specific means. These polysaccharides may also aid the delivery of minerals through the roots and promote beneficial bacteria and fungal populations.

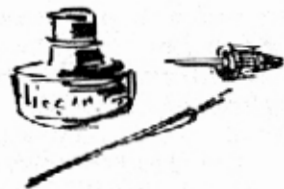
This is a worthy area of research and I would wish that large garden clubs set up scholarships to fund our talented young people doing biology honors projects or working at the masters level.

Readers can make their own alginates in a blender if they have access to the ocean shore, or they can buy them at well-stocked garden centres or from specialty mail order firms listed in the advertising section of good gardening magazines. They are generally cheap at around \$7/liter and a small amount is said to go a long way. Seaweed is a frequent additive to bone, fish and bloodmeal formulations (Ritchie's Feed and Seed, Ottawa). Synthetic hydrophilic polymers that look like agar or tough Jello are also on the market. They are incorporated into potting soil and thus reduce the need for frequent watering.

All this discussion should open up new worlds of inquiry for keen gardeners. Just when you thought you did it all, along came bug and plant juice.

## RESOURCE READER SERVICES

**AT THE COMMON GROUND** Country Fair, kids can do things they've only heard their grandparents talk about: milk goats, churn butter, spin wool and pitch manure. The Fair, Maine's celebration of rural living, takes place at the fairgrounds in Windsor, Maine, September 24-26. This mixture of old and new will feature demonstrations of new and traditional techniques of ecological agriculture, discussions on farming life, sales of organic produce, and exhibits ranging from the newest innovations to the traditional crafts and skills of rural New England. Contact the Common Ground Country Fair, Box 2176, Augusta, ME 04338.



**FARMABILITY** IS an association of farmers with disabilities and their families, helping not only the obviously disabled in wheelchairs, but those who have difficulty doing their work because of arthritis, back problems and the like. President Carl Palmer, a beef farmer and double leg amputee, wants more people to join up and attend a possible annual meeting in late September. For information for you or someone you know, write to Anne Hutten, RR 1, Kentville, N.S. B4N 3V7, or phone (902) 678-7088.

**"THE FAIR" WILL CELEBRATE** rural life, skills and traditions in a new location this year. A farm in Knowlesville, New Brunswick, (home of the Falls Brook Centre for sustainable community development), will host The Fair on September 18-19. What won't change is The Fair's upbeat and entertaining promotion of sustainable living with the land, Celtic and bluegrass music, great food, craft and commercial booths, and stimulating discussion. Contact Carol Maurey (506) 463-2750.

## Observations

by Max Banks

### WOUNDED TREE

Fruit was forming on a young plum tree when the mower unfortunately lifted a strip of bark, fully halfway around the trunk. My first thought was to remove the loose bark and paint the wound. Realizing this large area of missing bark would seriously affect its health and its future, I quickly replaced the torn section and tied it with coarse string that happened to be in my pocket.

Time passed, and five weeks later, I was surprised to see the string was cutting into the bark, which meant that growth was taking place. The string was removed to find the torn section of bark was completely reunited and barely noticeable. To experienced people this may come as no surprise; yet there may be others like me!