Program Introduction

Welcome

Welcome to the BFA Organic School Gardens program for Primary Schools

Following an overwhelmingly positive response to our February 2010 survey from primary schools across Australia, Biological Farmers of Australia (BFA) is delighted to present a free organic gardening program for primary schools featuring practical and easy-to-use online resources and lesson plans.

Biological farming is a phrase to describe biodynamic and organic farming. Both organic and biodynamic farmers understand that biological activity in soil is the secret to healthy, fertile, more productive soils. Both use innovative, non-chemical techniques to farm in harmony with the environment and produce quality food.

Organic and biodynamic cultivation is the smart way to keep farming and gardening sustainable for the future – improving soil, encouraging wildlife and woodlands, keeping pollutants out of our land, air and waterways, preventing disease, and benefiting our health and way of life.

The BFA program is unique in that it is based upon Australian organic standards and is focused on teaching environmentally conscious, sustainable organic cultivation rather than home economics. This program is designed to be adaptable to all schools, including children with special needs and schools with very limited resources. It encourages participation from parents and friends in supervising the program, and each lesson can be extended beyond one class period to suit comprehension levels of students.

Program Introduction

Welcome cont:

Program Benefits

The program provides practical applications for school subjects in nutrition, natural sciences, mathematics, language, environmental studies and life skills for students aged 8 to 12 years of age.

Teaching students how to grow nutritious food in a safe, sustainable way helps them to understand the benefits of natural foods and encourages them to include more natural foods in their diet.

In participating in this organic gardening program, students also learn:

- How important plants are to all food production, and how agricultural practices affect the environment
- Basic botany through lessons and observations of plant growth in simple experiments, and how plants reproduce
- How soil life forms affect the health of plants
- Practical applications for mathematics in measuring planting distances, dividing beds for broadcasting seed, and weighing seed and produce
- About beneficial insects and fauna, and respect for nature
- The benefits of biodiversity
- How to manage natural resources
- How to work as part of a team
- Responsibility in caring for living things
- A sense of pride in being able to produce their own food

The program also expands students' vocabulary through a glossary of gardening words, and students improve their communication skills through keeping a diary of the progress of their garden and records of crop rotation, as well as writing a summary of what they liked best about the program.

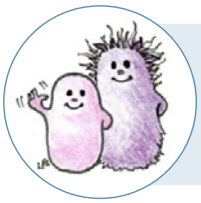
Program Overview

This program is free of charge and provides written materials for lessons both inside and outside the classroom as well as support in the form of advice for supervisors

Schools registered to participate in the program may be eligible for financial support for the building of gardens and purchasing equipment through our Starter Schools or Local Heroes programs. (See links on the right hand side of the Home page.)

The subjects covered in each lesson are designed for students to complete in a single school period each week, but schools should proceed through the lessons at a rate suitable to the comprehension level of their students, and their individual school situation. Naturally, seedlings and garden plants will require more than weekly attention for watering, etc.

As collecting equipment and setting up garden beds, compost bins and/or a worm farm may take several weeks, particularly if labour can only be provided at weekends, the first lessons in this program do not include garden activities. Activities can be conducted in the classroom or a suitable outdoor area, depending on each school's facilities.



To help students understand the importance of 'living soil', beneficial bacteria and fungi are introduced in Lesson 3 as characters, and they appear throughout the program, where relevant, to remind students of the vital role that soil microorganisms play in organic cultivation.

Program Introduction

Program Overview cont:

Each lesson is accompanied by a separate set of notes for those supervising the program – advising of any preparation required, and providing an overview of important points that are demonstrated. To further assist teachers and supervisors, the second part of this Introduction also provides basic advice for adults on setting up garden beds, making compost, worm farming, and a list of open-pollinated seed suppliers.

The program includes:

Lesson 1
Good nutrition and seed germination

Lesson 2
How plants grow – photosynthesis, shoot and root growth, planning what to grow in their garden

Lesson 3
Making soil healthy – organic matter in soil, beneficial microorganisms in soil and their functions, and how compost is made

Lesson 4
Making soil healthy part 2 – outdoor lesson on worm farming

Lesson 5
Sowing seed in recycled seedling containers and sowing legume seed in garden beds, plus caring for seedlings, and keeping a garden diary

Lesson 6
Planting seedlings into garden beds, sowing seeds directly into beds, and crop rotation.

Lesson 7
Saving water in the garden and mulching beds

Lesson 8
Caring for plants, weeding, and protecting plants from extremes of heat, cold and wind

Lesson 9
Soil pH and how it affects plant growth (with additional text for senior students)

Lesson 10
Garden friends and enemies - working with the environment to control pests

Lesson 11
Saving seeds and taking cuttings

Lesson 12
Sowing green manure crops (plus nitrogen fixation for senior students)

Primary schools commence their long summer break from between 10th and 17th December, and the summer holidays can be used to grow a green manure crop (which requires minimum maintenance) to revitalise the soil for the following year.

Graduation class is optional - Students can formally discuss or write about what they enjoyed most, and 'Organic Gardener' certificates can be presented.

Volunteers

Parents or local gardeners will be needed to help set up the school garden beds, compost containers and worm farms. A couple of working bees at weekends may be sufficient to provide the basics if you can recruit enough parents.

A compost supervisor who is available to keep the compost bin working and ensure that unsuitable materials are not added, will be an important asset to this program. Tips and hints on setting up beds, compost areas and worm farms are provided in Part 2 of the Introduction – 'Getting Down to Earth'.

Program Introduction

Volnteers cont:

Ideally, at least two adults should help supervise the students' work in the garden during the program. Gardening expertise for teachers and volunteers is not necessary, as the information provided in each lesson and the accompanying 'Supervisor's Notes' will enable parents to learn organic cultivation along with the students.

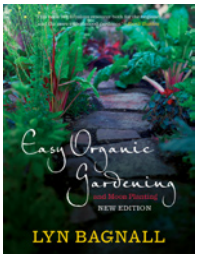
To inform parents of the health and environmental benefits of organic cultivation, and encourage their assistance in the program, some schools are sending out to parents a newsletter that includes the 'Why teach organic cultivation?' section of the letter that was sent to all schools with our survey in February 2010.

Parents who are unable to physically participate in the program may wish to help by contributing some suitable tools or pots from their home gardens.

As a literary exercise, students from some schools are writing to local business requesting donations of materials that they need for the program.

Additional Resources

1) REFERENCE BOOK



Easy Organic Gardening and Moon Planting
Lyn Bagnall (Scribe Publications 2006, 2009)

This practical handbook of 500 pages written by the author of this program (a certified organic farmer and gardener) is recommended as a reference for supervisors of the program.

Written for Australian conditions with climate change in mind, it provides detailed cultivation notes for individual fruits, vegetables, culinary herbs and flowering annuals, a perpetual monthly garden diary that advises what to sow, plant out and fertilise in each Australian gardening zone, and how to identify your gardening zone. Gardening zones are based on the type of plants that can be grown in a particular area in gardens with moderate irrigation, rather than temperature range and rainfall.

The gardening diary can be used without moon planting by selecting any of the recommended plants in any phase for your gardening zone each month, as it may not be easy to co-ordinate moon planting with the timing of lessons.

Comprehensive information on all subjects included in the school gardens program is covered in this book, including:

- Why biological activity in soil is necessary for sustainable cultivation practices
- Organic fertilisers and their uses
- How soil pH affects plant growth
- Growing food crops in beds, boxes and pots
- Crop rotation to prevent soil-borne diseases
- Drought-proofing gardens
- Protecting gardens from heat and frost
- A guide to plant propagation
- Recognising beneficial fauna in gardens
- Organic methods of pest control
- Easy-to-follow guides on growing green manures, composting and worm farming.

Program Introduction

Additional Resources cont:

Where information in the book relates to particular points in the program's lessons, page references are given in the supervisors' notes as EOG&MP pp …..

> ***"Our children will face serious challenges in addressing climate change and an increasing world population",*** **Lyn says.** ***"We can equip them with the skills and enthusiasm to secure their future food supply and protect the environment by sharing with them, in a practical way, our knowledge of sustainable organic cultivation."***

Organic cultivation is beneficial for a school's entire garden. Cultivation information on Australian natives and popular exotics, and a list of drought-resistant shrubs and trees is also included in Easy Organic Gardening and Moon Planting to assist in making your school grounds more environmentally-friendly and more tolerant of adverse climate conditions.

Copies of Easy Organic Gardening and Moon Planting can be obtained from the BFA Head Office 07 33505716 for a special school's price of $49.95 including postage (normally $64.95 including postage and handling)

Read book reviews at:
http://aussieorganicgardening.com/?page_id=691#reviews

2) GLOSSARY

A glossary of 'gardening words' is included in the program. Explanations and pronunciations are given in simple language that children can understand. To access the glossary at any time, click on the 'Glossary' link in the Supervisor's or Lessons menu.

3) CROP CHART

The crop chart included in this program provides the minimum time from sowing seed to harvest for each major gardening zone. It is designed to help you to time the sowing of seed so that crops are not likely to need harvesting at the beginning of school holiday periods. For some crops, such as potatoes, pumpkins, garlic and onions, some leeway won't affect the quality of the crop, but other vegetables will spoil if not picked at the correct time.

This crop chart also colour codes crops into groups that belong to the same family or are likely to share diseases, and those that have proved to be good companion plants (e.g. basil in the same colour-coded group as the tomato family). The colour coding is designed to help in practising a suitable crop rotation.

This chart also shows the nutritional value of each crop, including the very important antioxidants.

This chart can be accessed at any time by clicking on the 'Crop Chart' link in the Supervisor's or Lessons menu.

4) SEED SAVING

This program includes a lesson on saving seed for a few easy-to-save species. For more detailed information on saving seed from a range of individual plants, we recommend The Seed Savers' Handbook – Michel & Jude Fanton (The Seed Savers' Network, 1993).

Visit http://www.seedsavers.net/seed-savers-handbook-online

Additional Resources cont:

5) RECIPES

A collection of 13 simple recipes that include typical fruits and vegetables grown in school gardens will be provided for students to try at home.

6) WET WEATHER ACTIVITIES

When unsuitable weather prevents students from participating in gardening lessons, some fruit and vegetable related activities can be found on the 'Fresh For Kids' website that is produced by Sydney, Brisbane and Newcastle fruit and vegetable markets.

Activities include quizzes, 'word match' and 'find a word' games that will help students to recognise, spell, and learn more about a wide range of natural foods.

Visit: http://www.freshforkids.com.au/activities/activities.html
Visit: http://www.freshforkids.com.au/games/games.html

7) HELPLINE

For schools registered as participants in the program an e-mail address is available for advice on particular problems that supervisors may encounter. Questions sent to this address will be directed, by BFA, to the relevant expert, and advice will be provided as soon as possible.

The help-line address is: **education@bfa.com.au**

5 Equipment Inventory

1) GARDEN HAZARDS TO AVOID:

CCA treated timber (treated pine)

Timber treated with copper, chromium and arsenic as a preservative has been phased out for all domestic use in the United States, European Union (EU), Canada, Indonesia and Vietnam, and restrictions placed on their use in Japan.

The Australian Pesticides and Veterinary Medicines Authority (APVMA) conducted a review of CCA treated timbers and, in March 2005, declared this preservative to be a restricted chemical product (RCP) in the public interest.

The review states that the APVMA "were not satisfied that the continuing use of CCA for timber used in structures with which the public (and particularly children) are likely to come into frequent and intimate contact is safe", and APVMA regulations that restrict the uses of CCA treated timbers came into effect at the end of March 2006.

Included in the APVMA regulations is (10.1. iv): **"not permitting uses of CCA timber treatment products for timber intended for use as garden furniture, picnic tables, exterior seating, children's play equipment, patio and domestic decking, and handrails".**

Common sense would dictate that the APVMA restrictions would also apply to school garden beds (as they do to sand pits) because these timbers can leach arsenic (a known carcinogen) onto the timber surface and into compost and soil for up to 20 years, and that there are a number of factors that increase the amount of arsenic leached from treated timbers, including high UV light levels.

Equipment Inventory cont:

The APVMA regulations do allow the use of CCA treated timber for 'structural timbers' and the timber industry has included retaining walls in that description. However, the APVMA Review (page 11) clearly states, structural timbers "where frequent contact is unlikely, and the level of exposure and risk, is low". For more information, see: www.apvma.gov.au/products/review/docs/arsenic_summary.pdf

Alternative timber preservation methods are available. However, some contain pesticides that are developmental neurotoxins, and others leach copper or boron – some plants and soil organisms are sensitive to excess amounts of these trace elements. Consequently, we do not recommend the use of preserved timber as edging for garden beds in schools. Suitable edgings are suggested in the 'Garden Beds' section of 'Introduction 2: Getting Down To Earth'.

For other structures in school gardens, timbers preserved with alkaline copper quaternary (ACQ) appear to be the most readily available. Unfortunately, ACQ timbers also have a green tint, which weathers over time to a honey brown. As the labels on CCA treated timbers are affixed with a single staple and easily dislodged, the onus is on the consumer to ensure before purchase that the timbers are preserved with ACQ, not CCA.

For more information on products containing alternative methods of timber preservation, see: http://www.herinst.org/CCAtimber/alternatives/chemical.html

Carpet and carpet underlays

Natural fibres are treated with persistent pesticides before sale, and many carpets contain toxic chemicals as stain or flame repellents. Some felt underlays were made from asbestos-contaminated hessian. When exposed to the elements, chemicals from these products can leach into beds, compost and worm farms if used as covers or to suppress weeds.

Phospho-gypsum or by-product gypsum

Phospho-gypsum is a by-product of synthetic phosphate fertiliser manufacture. It can contain high levels of cadmium, which is harmful to human health and not suitable for organic gardening. Please check before purchase that the packaging has an organic-allowed label (see below) or the label clearly states that the product is natural or mined gypsum. (See EOG&MP pp 37-8)

ALLOWED INPUT XXXXAI BFA REGISTERED PRODUCT

NASAA INPUT FOR ORGANIC PRODUCTION

Old car tyres (See EOG&MP p 27)

Car tyres can leach cadmium and other heavy metals into soil as they weather, and should never be used for garden or compost containers. Plenty of well-made, mature compost in garden beds can limit cadmium uptake. However, cadmium uptake by plants is increased in acidic soils; soils containing immature compost or uncomposted manures, or where water is high in chlorine. (See EOG&MP p 27)

Uncomposted manures and mulch cut from pastures sprayed with broadleaf weed killers

Aminopyralid, a relatively new herbicide ingredient in Australia, kills broad-leaf plants by disrupting plant cell growth. It does not affect grasses, but can remain active in them, and manures from animals that eat sprayed grasses, until it is completely broken down by soil microbes. Beds contaminated with aminopyralid can remain unusable for up to 20 months. In the United Kingdom, this herbicide ingredient caused widespread damage to allotment gardens in 2008. UK residents were advised not to eat produce from gardens affected by aminopyralid. As a precaution, use only animal manures that have been 'hot' composted (see making compost), and check before purchase that mulch hay does not come from pasture that has been sprayed with 'Archer', 'Hotshot', 'Starane' or 'Grazon'.

Plastics with recycling codes 3 and 7

Recycling code 3 is for polyvinyl chloride (PVC) products (including old plastic shower curtains) that leach toxic chemicals. Recycling code 7 covers polycarbonate and resin products that may leach Bisphenol A (BPA) when exposed to heat.

Program Introduction

Equipment Inventory cont:

Herbicides should not be used to clear the garden area of weeds or other vegetation (or at any other time)

These products kill, or inhibit, a range of soil organisms, and increase the incidence of soil-borne diseases. They can also cause allergic reactions in humans, especially children. These products will counteract your efforts to produce healthy, organic soil.

2) BASIC EQUIPMENT:

- **A compost container and/or worm farm to recycle waste**
- **A lidded bin** where students and canteen staff can place composting materials
- **A large gardening fork**
- **A spade** for chopping tough compost materials and turning compost
- **A rake**
- **2 or 3 watering cans** with fine spray nozzles for watering seedlings
- **A garden hose with fittings**
- **Several 9-litre plastic buckets**
- **Open-pollinated vegetable seed.** Open-pollinated vegetable seed. 'click on the link in the Supervisor's menu for a list of open-pollinated seed suppliers.
- ***You will need a small quantity of vegetable seeds, and a few corn and pea or bean seeds to conduct the experiments in Lessons 1 and 2***

- **Plastic containers for seedlings** (these can be collected by students). 750 ml PET bottles (recycling code 1) can be used as miniature greenhouses. Recyclable plastic large drink containers with codes 2, 4 and 5 are the safest to use when exposed to the elements
- **Each student will need a hat and gloves for outdoor work.** Try to avoid PVC gloves as they can leach chemicals in hot weather. Children's work gloves can be found at K-Mart and Bunning stores. Bulk quantities of children's gloves can be ordered from Green Harvest (**www.greenharvest.com.au**). Bulk quantities of children's leather work gloves can be ordered from Esidirect by calling: 1300 446 707 (**see www.esidirect.com.au**)
- **A selection of hand tools** to be shared by students when working in their garden
- **2 x 64-page exercise books** - one for a crop journal and one for a crop rotation record and watering roster

- **A soil pH test kit** - Manutec produce an easy to use kit that is sold through major hardware chains and nurseries
- Some **large pots** for perennial herbs
- **A bag of organic-allowed seed-raising mix** and a bag of organic-allowed potting mix for an early experiment. The remaining mixes can be used in other lessons. Avoid potting mixes merely labelled 'organic' as these will contain some chemical substances that could affect the outcome of the experiments.
- **Plant ties** - we recommend strips cut across old singles and T-shirts as plant ties. These provide some elasticity and won't damage plant stems.

Equipment Inventory cont:

Selecting organic garden inputs:

Organic-allowed products cannot be termed “certified-organic”, but they have been registered with an organic-certifying body as suitable for use in organic systems. BFA Registered ‘Allowed Inputs’ are products which have undergone strict assessment to determine that they are suitable to be used in certified organic farming systems.

Look for the BFA ‘Bud’ logo when buying gardening inputs (soil and plant nutrition products, livestock supplements, and products to assist with weed, pest and disease control) for your guarantee that products contain no harmful synthetically derived chemicals.

The BFA Registered Input Directory is updated quarterly and available for download at the following web page: **Organic Farming Inputs**. If you need any further information on BFA registered products please contact the BFA on **education@bfa.com.au** or **ph 07 3350 5716.**

Most large nurseries now carry organic-allowed growing mixes, fertilisers and garden products. Organic-allowed products will always show the certifying body’s logo and a registration number on the label. In Australia, the two logos that you can find on products allowed for use in organic farming and gardening are BFA and NASAA. Use whichever is most easy to obtain.

ALLOWED INPUT XXXXAI
BFA REGISTERED PRODUCT

NASAA
INPUT FOR ORGANIC PRODUCTION

Example logo - if you see this logo on an organic gardening product, it has been registered for use in organic systems.

3) OPTIONAL EQUIPMENT

You may also need more organic-allowed potting mix for growing crops in containers if garden beds are not ready in time for the lesson on planting out seedlings.

If you are not using green manure as mulch, you will need mulch to cover beds. See EOG&MP pp 168-172 for when to apply mulch.

If you don’t have enough mature compost when preparing beds for transplanting seedlings, you will need some organic-allowed complete fertiliser. Apply as directed on the label. If your new worm farm is not producing enough worm castings to fertilise seedlings, you will need a small quantity of organic-allowed liquid fertiliser.

Please note that although seaweed extract fertiliser has many benefits as a supplementary fertiliser, it contains mostly potassium and trace elements and is not a substitute for a complete liquid fertiliser.

You may need more than one bag of organic-allowed seed-raising mix depending on the number of seedlings your students want to grow.

You may also need garden stakes and garden twine or bamboo poles to support climbers, and white netting to protect crops from birds and fruit bats, depending on your area and your choice of crops.