

Envirotalk



GOVERNMENT OF BERMUDA
Ministry of Environment and Planning

SPRING 2013
VOLUME 81 No. 1

PROMOTING APPRECIATION, ENHANCEMENT AND CONSERVATION OF BERMUDA'S ENVIRONMENT

WELCOME

to our Spring edition of Envirotalk.

- **Dr. Joanna Pitt**, Marine Resources Officer, talks about Bermuda's lionfish invasion.
- Exhibition Officer, **Georgette Caines**, discusses the upcoming 75th Agricultural Exhibiton.
- Bugs on your plant!?! **Toi Wellman**, Agricultural Assistant, suggest some environmentally friendly ways to rid your plants of pests.
- The **Agricultural Officers** at the Government Marketing Centre give an overview of their section.
- See the planting calendar to get a head start on what to plant this Spring.

Please contact:

Envirotalk mailing list: envirotalk@gov.bm to be placed on the mailing list or for suggestions for future articles.

Editor's note

April 22 marks the 43rd anniversary of Earth Day. More than one billion people worldwide will participate in this event. To find out more about Earth Day, please visit the Earth Day Network at: www.earthday.org. Also don't forget May is International Compost awareness month with 22 May being the International Day for Biodiversity. The theme this year is: Water and Biodiversity, which coincides with the United Nations International Year of Water Cooperation. To find out more about this movement, please visit: <http://www.unwater.org/watercooperation2013.html>.

Kimberly Burch – Editor

A NEW FISH IN TOWN: LIONFISH IN BERMUDA

As many Bermuda residents are now aware, there's a new fish in town; lionfish (*Pterois volitans* and *Pterois miles*), scorpionfishes native to the Indo-Pacific region, have invaded the western Atlantic. Lionfish were first observed off Florida in the 1980s, presumably released from commercial or hobby aquaria. By 1999, the first lionfish outside of U.S. waters was found in Bermuda, and the past 13 years have seen lionfish spread throughout the Caribbean and Gulf of Mexico.

Feeding voraciously on juvenile and other small fishes, lionfish have the potential to seriously impact the populations on which our commercial and recreational fisheries depend, as well as the populations of herbivores and cleaner species that are critical to the overall health of our coral reef ecosystem. Healthy coral reefs provide irreplaceable environmental services to our island and play a key role in attracting tourists to Bermuda. The perception that our marine environment is safe for swimmers, snorkellers and divers is also important for tourists. Lionfish are venomous and, should the population increase to the extent that they are frequently encountered, the associated public health risk would not only affect locals but could also impact our tourism sector. Controlling the lionfish population in Bermuda is therefore vital to both our environment and our economy.

While the extent of the lionfish invasion across the region means that it will not be possible to get rid of them completely, control of the lionfish population in Bermuda is possible if a comprehensive programme is put in place soon, and various groups have been working towards this goal. In 2008, Chris Flook at the Bermuda Aquarium, Museum and Zoo (BAMZ) initiated a programme to train snorkellers and SCUBA divers to cull lionfish and, in 2010, the Department of Environmental Protection made a commitment to develop a way for commercial fishermen to target lionfish. Lionfish are already caught regularly in lobster traps set offshore in 150 to 200 feet of water, and the lionfish population appears to be concentrated at these depths at present, although the reasons they congregate there are not well understood. The Ocean Support Foundation (OSF), a local NGO started by Graham Maddocks of Triangle Diving, has been working with specially trained divers to cull lionfish at these depths, which are too deep for snorkellers and most recreational SCUBA divers.

In October 2012 a workshop focused on developing a lionfish control plan for Bermuda was held at BAMZ. It was organized by OSF together with a local committee, and facilitated by Dr. James Morris of the U.S. National



Lionfish off Natural Arches at a depth of 204'. (Photo by: Ondrej Hindl)

Oceanic and Atmospheric Administration (NOAA) and Lad Akins of the Reef Environmental Education Foundation (REEF), leading authorities on the lionfish invasion. There were 29 participants representing 14 stakeholder groups and organizations, including relevant Government departments and boards, environmental NGOs, dive shops, commercial fishermen and those with lionfish culling permits – an impressive turnout.

The workshop focused on the status of the lionfish problem in Bermuda, approaches for control and local assets that could contribute to a control programme. A summary document identified five key components for a control

plan: education and outreach; assessment and research; culling/removal; monitoring; and data management. First and foremost, Bermuda residents need to be aware of the lionfish problem and know how to report a lionfish sighting or handle a lionfish if they happen to catch one while fishing. One of the most cost-effective ways to control lionfish is to develop a commercial fishery for them, so it is also important for the public to know that lionfish are not only safe to eat but also very tasty! The workshop also made it clear that research on the distribution, behaviours and impacts of lionfish in Bermuda waters is needed if we are to understand the dynamics of this population well enough to control it.

The Bermuda Lionfish Taskforce was formed to oversee the writing of a comprehensive, long-term lionfish control plan based on the material generated during the workshop. The Taskforce has representatives from the Department of Environmental Protection, the Department of Conservation Services, the Bermuda Zoological Society, the Bermuda Institute of Ocean Sciences, a local dive shop, a commercial fisherman and a lionfish culler. There is also a place for a member of the business community that is yet to be filled. Jim Gleason of OSF will be the Taskforce chair for the first phase.

Taskforce members are preparing proposals that seek to acquire funding for the research that needs to be done in order to get key information necessary for a control plan to be implemented. The Taskforce may ultimately



develop into a steering committee to oversee the implementation of the control plan.

For more information about the lionfish problem in Bermuda, and to find out how to get involved in the efforts to control this invasive species, visit <http://www.oceansupport.org>.

*Dr. Joanna Pitt
Marine Resources Officer
Department of Environmental Protection*

75TH AGRICULTURAL EXHIBITION

A visit to the 75th Bermuda Agricultural Exhibition is a must this April. This well-loved national event is a perfect blend of the old and the new, and it's a wholesome, fun event for the entire family.

Held this year on Thursday, 18 April, Friday, 19 April and Saturday, 20 April, the Exhibition showcases the best Bermuda has to offer both agriculturally and culturally. Each year livestock, vegetables, fruits, floriculture, homemade food products, wood craft and educational categories are brimming with entries. Cow milking, equestrian events, poultry judging, home baked goods...everything you would expect will be found on site at the Botanical Gardens in Paget.

Entertainment in the lower ring provides a second focal point for those who have wandered away from the Main Ring.

Thursday is the most popular day with seniors, preschoolers and anyone else who wants to see the items on display at their peak of freshness. Friday has been titled "No school day" and the students look forward to it each year. Hundreds of students take full advantage of the holiday to see if they've won a coveted rosette or 'highly commended' sticker. Saturday is

generally a family day. Many come out to enjoy the day and the beautiful setting.

Food is available courtesy of registered charities, which set up small booths and provide fast food, Bermuda style.

Do not miss this very special annual tradition. Tickets are available at the Exhibition on the day. Adults: \$10. Children under 16 and seniors: \$5. Children under five are free. For more information call 239-2351 or e-mail: exhibition@logic.bm or visit www.bdaexhibition.bm

Georgette Caines
Exhibition Coordinator
Department of Parks

BUGS?! BE GONE!

Year after year some plant exhibits are turned away at the Agricultural Exhibition due to the presence of an insect infestation or disease. Quite often many people are taken by surprise when the insect or disease is pointed out to them at the time of entry, because they have not been informed about common garden pests. To ensure that your plant entry for the Agriculture Exhibition is accepted, I will discuss in this article a list of tips for safeguarding your plants from those common garden pests, which may not be visible to the naked eye. *Descriptions of the insect pests mentioned in this article are available in previous issues of Envirotalk (Vol. 80 No. 2 and Vol. 80 No. 3, 'Citrus Pests')*

The most common garden pests that may attack your plants are aphids, spider mites, scale insect and caterpillars. Aphids are small green or brown insects and are usually found in clusters on the underside of young leaves, unopened flower buds, and stems. Curling leaves indicate aphid damage, though the aphids maybe long gone. Like aphids, spider mites can also be found feeding primarily on the underside of leaves; however they are more difficult to see with the naked eye. Signs of spider mite damage include yellow or brown spots and webbing on the leaves of the plant.

Powdery mildew is a common fungal disease that is typically found on cucumbers, pumpkins, zucchini, strawberries, and peas. It occurs in warm moist conditions and can be characterized by white, mouldy growth on the leaves and stems of plants. It is caused by dampness or high humidity, crowded plantings and poor air circulation. A solution of 1 tsp baking soda and 1 quart water can be used on your plants to protect them from powdery mildew.

Good cultural practices are vital in maintaining healthy plants:

- Check your plants frequently for the presence of insects and diseases.
- Make sure that your garden or potted plants are in an ideal location. They should get adequate amounts of sunlight according to the plants specific needs.
- Feed the soil. An all-purpose fertilizer 10-5-10 can be used, or you can make a compost tea. Alternatively, you can use composted chicken manure which gives your plants nitrogen, composted horse manure, compost and seaweed add microorganisms into the soil.
- Don't over-fertilize your plants.
- Don't overcrowd your plants. This helps minimize the spread of diseases and insects.
- Rotate your crops so you are not growing the same vegetable in the exact spot every year. This helps to prevent nutrient depletion in the soil. It also helps to stop the buildup of pests and diseases that are found in the soil.
- Rotate the pesticides you use to avoid pesticide resistance. You can purchase non-toxic insecticides from your local garden supply store or make your own using everyday household items.

Homemade Insecticidal Soap Recipe¹

This recipe will control chewing insects such as: aphids, spider mites, mealy bug and young soft scale insect.

Ingredients:

- 2 tbsp dish soap
- 1 gallon water
- One 24 or 32 oz. spray bottle

Mix dish soap and water, transfer to a spray bottle and test the solution on a small portion before spraying the entire plant. Transfer to a spray bottle. Test the solution on a small portion of the plant before spraying the entire plant. Make sure you cover all parts of the plant including the underside of leaves when spraying. Apply every other day until all signs of infestation are gone. You can also spray this solution on your plants as a preventative method to keep insects at bay.

Note: To treat adult scale and caterpillars you can use an insecticidal soap with the addition of 2 tbsp of olive or vegetable oil.

Pest Prevention Concentrate²

- Ingredients:
- 1 cup dish soap
- 1 tbsp vegetable oil

Directions: Mix ingredients together then store in an airtight container. Use 1 to 2 teaspoons of the concentrate and mix with a quart of water. Pour into spray bottle. Make sure you get good coverage on both sides of the leaves, stems, the flower buds and new shoots when applying. Repeat every other day in hot weather until all signs of pests are gone. Apply once a week for three weeks in warm to cool weather.

Note: Treat plants in the morning or afternoon when it is cool to avoid burning from the sun.

In addition, you can also opt to take a more comprehensive approach by companion planting for natural pest control and fertilization. Companion planting can help deter harmful pest from attacking your plants as well as limit the spread of diseases. Consider planting the following plants in your garden to help maintain healthier plants:

Basil – protects plants from diseases and insects;

Borage – deters tomato hornworms and cabbage worms, it also adds trace minerals to the soil;

Calendula – attracts hoverflies which are beneficial insects that feed on aphids;

Chives – help prevent mildew, as well as deters aphids, cutworms and hornworms (which are typically found on tomatoes);

Coriander – repels harmful insects such as aphids and spider mites;

Marigolds – attract hoverflies, which prey on aphids;

Nasturtiums – keep aphids and cabbage worms at bay and deter whiteflies. Check out the internet or the library for more information on companion planting.

Some useful websites are:

<http://www.ghorganics.com/page2.html>

<http://groundtoground.org/2012/01/25/companion-planting-natural-pest-control-and-fertilization/>

<http://www.groedibles.com/2012/06/interplanting-companion-planting-for-pest-control-and-healthier-gardens/>

By incorporating the tips mentioned above into your gardening routine, you

will be able to keep pest and diseases to a minimum. In addition, you will be able to ensure that your plant exhibits are looking their best and healthiest when entering them in the upcoming Agricultural Exhibition.

Toi Wellman

Agricultural Assistant

Department of Environmental Protection

Citations

¹Fahs, Barbara. 'Recipes for All-Natural Insecticides for Vegetable Plants'. *Gardens Guides*. 2010. Web. Feb. 26, 2013 [<http://www.gardenguides.com/104973-recipes-natural-insecticides-vegetable-plants.html>]

²'Natural Homemade Pesticides: Recipes & Tips'. *Tipnut*. 2013. Web, 26 Feb. 2013 [<http://tipnut.com/natural-pesticides/>]

THE GOVERNMENT MARKETING CENTRE

The Government Marketing Centre, located at 38 School's Drive, just north of CedarBridge Academy and the Prospect Police Compound, was established in 1943 and is responsible for managing, monitoring and preserving Bermuda's agricultural industry. The Marketing Centre Staff consists of four employees: the Agricultural Officer, the Agricultural Assistant, the Marketing Centre Manager and the Porter.

Functions and Services

The Marketing Centre provides support to Bermuda's farming industry by:

- Maintaining market stability for local farmers to sell their produce.
- Advising farmers on pricing and managing supply and demand of their produce.
- Monitoring the quality of locally-grown produce that is sold to consumers and ensuring local prices are competitive with imported produce.
- Encouraging further development of local fruit and vegetable production through education and awareness.
- Performing crop variety trials to ascertain what varieties will perform well in our climate.
- Selling containers, seed and chemicals to registered farmers.
- Selling flake ice to fishermen and farmers.

In addition to the services provided by the Marketing Centre chilled storage space is also rented to customers. Farmers typically lease the storage facility for both long- and short-term use when their harvest exceeds what can be immediately sold and for what will not fit in their personal chill rooms.



Photo by: Thomas Sinclair.

Other customers, such as plant nurseries, use the space to store lily bulbs in cold storage to promote spring growth and beekeepers have started to use the space for keeping empty beehives free of pests like waxmoth, which can destroy stored honey comb.

Two modern banana ripening rooms are also housed onsite, providing a banana ripening service to growers who have their own customers or vegetable stands. Additionally, when orders are placed, the Marketing Centre buys bananas from registered growers and after ripening them, sells them to the stores and markets that requested the bananas.

Extension Services

The Marketing Centre also provides additional extension services to the public by providing technical and educational support. The extension services provided by the Marketing Centre consist of:

- Assisting registered farmers in culling feral chickens around fields and farms to reduce crop loss.
- Providing assistance and advice to home gardeners and schools to develop square foot gardens.
- Giving educational talks to schools and associations about Bermuda's agricultural industry.
- Frequent field checks to assess the quality, health and abundance of the crops grown on the island.

Field checks are particularly important as they are used to ensure that there is an adequate amount of quality produce to support an embargo. It also allows the staff at the Marketing Centre to keep abreast of what pest or disease problems are present in the fields and allows for timely diagnosis and recommendations for treatment of these problems. From time to time, farmers will also bring samples of a diseased crop to the Marketing Centre for diagnosis and advice. When there is an over abundance of a certain local crop, the Agricultural Officer can impose an embargo on the same imported product if deemed necessary.

Economic Embargo

The Marketing Centre provides the service of instating an economic embargo on crops. An economic embargo restricts the importation and sale of certain crops when they are currently in season. When there is a surplus of a particular agricultural product on island, a temporary embargo is put in place preventing the importation of that same item until the local supply runs low. Some examples of local produce that are put on embargo throughout the year are: English cucumbers, broccoli, cauliflower, peppers, tomatoes, herbs, potatoes, various types of lettuce, pumpkin, squash, onions, leeks, cabbage and beets. In addition to the economic embargoes, some products such as fresh carrots, corn and sweet potatoes are on permanent embargo for quarantine purposes due to their associated pests and diseases which can pose a threat to Bermuda's flora and fauna if introduced. All quarantine embargoes are enforced by personnel at the Plant Protection Lab, Department of Environmental Protection.

For any questions you may have about the Marketing Centre please contact the Agricultural Officer, Thomas Sinclair (tjsinclar@gov.bm) and Agricultural Assistant, Toi Wellman (tpwellman@gov.bm) at 292-4611.

*Thomas Sinclair and Toi Wellman
Agricultural Officer and Agricultural Assistant
Department of Environmental Protection*

PLANTING CALENDAR – WHAT TO PLANT IN THE SPRING...



Vegetables

March

Beans, Beets, Broccoli, Cabbage, Carrots, Cassava, Cauliflower, Chard, Christophine, Collards, Corn, Cucumber, Eggplant, Kale, Leeks, Lettuce, Muskmelon (Cantaloupe), Mustard Greens, Okra, Pepper, Potatoes, Pumpkin, Radish, Rutabaga, Squash, Sweet Potato, Spinach, Tomato, Turnip, Water

March

Beans, Beets, Broccoli, Cabbage, Carrots, Cassava, Cauliflower, Chard, Christophine, Collards, Corn, Cucumber, Eggplant, Kale, Leeks, Lettuce, Musk-

melon (Cantaloupe), Mustard Greens, Okra, Pepper, Potatoes, Pumpkin, Radish, Rutabaga, Squash, Sweet Potato, Spinach, Tomato, Turnip, Watermelon.

April

Beans, Beets, Broccoli, Cabbage, Carrots, Cauliflower, Chard, Christophine, Collards, Corn, Cucumber, Eggplant, Kale, Muskmelon (Cantaloupe), Okra, Pepper, Pumpkin, Radish, Rutabaga, Spinach, Squash, Sweet Potato, Tomato, Turnip, Watermelon.

May

Beans, Cucumber, Okra, Pumpkin, Radish, Squash, Sweet Potato, Tomato.

Flowers

March/April

Acrolinium, ageratum, alyssum, antirrhinum, aster, aubrietia, baby blue eyes, bachelor's buttons, bird's eyes, blanket flower, begonia, bells of Ireland, calendula, candytuft, carnation, centaurea, chrysanthemum, cineraria, coreopsis, dahlia, African daisy, dianthus, forget-me-not, geranium, gerbera, globe amaranth, globe gilia, godeita, gypsophila, hollyhock, impatiens, larkspur, lathyrus, marigold (African), marigold (French), nasturtium, nicotiana, pansy, petunia, phlox, phlox (annual), red tassel flower, rose everlasting, rudbeckia, salpiglossis, salvia, scabiosa, statice, snow-on-the-mountain, spider flower (cleome), star-of-the-veldt, stock, sweet pea, sweet William, verbena and viola.

May

Amaranthus, balsam, calendula, celosia, coreopsis, cosmos, gaillardia, gazania, globe amaranth, hollyhock, marigold, portulaca, rudbeckia, vinca and zinnia.

ON HER MAJESTY'S SERVICE



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