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Singapore Garden Festival

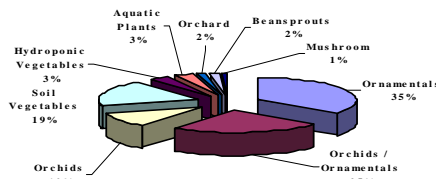


AVA will participate in the Singapore Garden Festival 2006 to be held at the Singapore International Convention and Exhibition Centre from 16 to 25 December 2006. This event, which is organised by the National Parks Board, will showcase the creations of top international award-winning landscape and garden designers, florists and horticulturists. AVA's display will include the popular Plant Clinic to assist with your plant growth problems, set amidst an attractive vegetable garden feature. To learn more about the colors and shapes of vegetables and how to combine them into a pleasant garden, make sure you do not miss this event. For more information, please refer to the website <http://www.singaporegardenfestival.com>.

Horticulture Production 2005

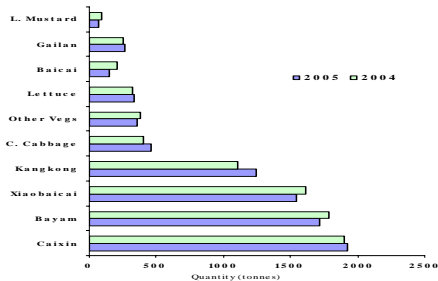
Singapore has 154 farms occupying a land area of 438.2 hectares (ha), of which 115.6 ha is for vegetable and foodcrop production while the remaining 322.6 ha is for orchid and ornamental plant production. The percentage area of land used for each type of horticultural production is shown in (FIG 1).

FIG 1: LAND AREA FOR HORTICULTURAL PRODUCTION (%) IN 2005



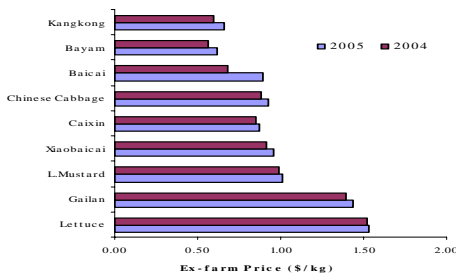
In 2005, a total of 17,369 tonnes (ton) of vegetables and foodcrops with a value of \$14.92 million were produced. These mainly consisted of beansprouts (52%) and vegetables (48%). Similar to last year, caixin, bayam, xiaobaicai, and kangkong accounted for 78% of the total quantity of leafy vegetables produced (FIG 2).

FIG 2: TYPES AND QUANTITIES OF LEAFY VEGETABLES PRODUCED



Ex-farm prices of leafy vegetables were slightly higher in year 2005 than in year 2004, particularly for caixin and xiaobaicai, which both increased by about 5% (FIG 3).

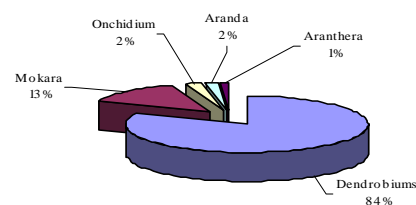
FIG 3: EX-FARM PRICES OF LEAFY VEGETABLES



Local farms produced approximately 12.46 million stalks of orchid cut flowers with an ex-farm value of \$3.56 million (mil). About 2.27 mil ornamental plants at a value of \$18.42 mil and

23.55 mil aquarium plants at a value of \$2.82 mil were also produced. *Dendrobium* orchid was the main type of orchid cut flowers produced, contributing to 84% of total orchid production (FIG 4).

FIG 4: TYPES OF ORCHID CUT-FLOWERS PRODUCED IN 2005



Annual Floriculture Trade 2005

Floriculture exports remained relatively stable at \$56.85 mil, compared to \$55.89 mil last year. Total export of fresh orchids, orchid plants and cuttings to top destinations like Japan (\$9.99 mil), Australia (\$4.83 mil) and Greece (\$1.28 mil) was 33% lower than 2004 at \$19.65 mil, but there was corresponding increase in export of the other floriculture products. Industry sources have accrued these fluctuations to increased demand for foliage and other plants in Australia and EU. Export of foliage, branches, other flowers, live plants and plant parts rose by 34% to \$23.33 mil, and aquarium plants accounted for the remaining \$13.91 mil.

Plant Pest Risk Assessment

Plant pests include insects, nematodes, bacteria, fungi, viruses, plants and other invertebrate animals, which affect plant growth, cause diseases or adversely affect the environment. In the global environment where more trade means increased movement of plant

commodities (plant and plant products), the risk of importing a pest through a commodity is also increased. As a measure to reduce the threat of new pests and diseases being introduced to local flora and domestic agriculture, a process called Plant Pest Risk Analysis (PRA) can be conducted. This can be done based on a commodity or on a particular pest associated with various commodities. PRA is a systematic way of gathering, evaluating, recording and disseminating information leading to recommendations for a position or action in response to an identified hazard. PRA is defined under the International Plant Protection Convention (IPPC) as: **“The process of evaluating biological or other scientific and economic evidence to determine whether a pest should be regulated and the strength of any phytosanitary measures to be taken against it”**. PRA may also be conducted on the import of a new commodity to determine whether it provides a pathway for pests to enter the importing country or an area of the importing country. The International Standards on Phytosanitary Measures (ISPM) sets the guidelines on conducting a PRA. The method broadly consists of 4 stages –

- i) **Initiation**: identification of the hazard.
- ii) **Risk assessment**: scientific evaluation of the biological risk and potential consequences.
- iii) **Risk management**: a process of determining appropriate measures to reduce risk.
- iv) **Risk communication**: supports each of the above 3 stages.

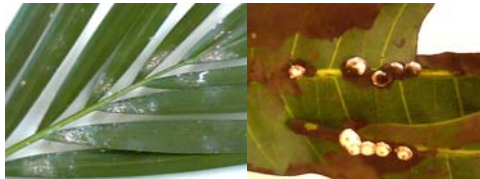
Risk Analysis is based on evaluating whether the organism in question is a plant pest, of agricultural importance or of likely damage to the

environment of the importing country. PRA are written to inform others on the decisions taken by the plant health policy makers. PRA results can be a simple conclusion that the risk is low and statutory action by the plant health service is not warranted. Such is usually based on conditions not suited to the establishment and spread of the pest or no host plants available. On the other hand evaluations can be lengthy documentations of assessment on biological factors, climate, maps, entry data, establishment and spread potential and estimated costs and benefits of the possible control measures to exclude a pest from an area, or to eradicate an outbreak. Specific treatments or risk mitigation measures e.g. pest control measures may be mentioned in a PRA. All risk analyses include some amount of uncertainty where evidence is lacking, inconclusive or contradictory. For organisms that have not been reported in the country of import, the PRA experts have to use their judgement in extrapolating from available data to assess how a pest might behave under local conditions on endemic crops and wild plants. If there is a wide range of uncertainty on the risk a precautionary approach is the likely result. Within AVA, the Plant Regulatory Branch and the Plant Health Laboratories work as a team to carry out regular PRA to facilitate trade but yet to safeguard plant health of our farms, greenery and horticultural interests.

Hemiptera: Friend or Foe

What is Hemiptera? Hemiptera is an order of insects possessing piercing and sucking mouthparts. This order consists of the sub-orders Heteroptera (bugs), Auchenorrhyncha (hoppers) and Sternorrhyncha (scale

insects, aphids, mealybugs, whiteflies, etc.). Many are plant feeders and are serious pests of cultivated plants. Their direct feeding can cause economic losses and damage that usually take the form of discoloration, distortions, browning or gall formation on infested plants. These can further lead to secondary effects such as sooty moulds and transmission of viral diseases.



Scale insects on palm & leaves

Others are beneficial, like the assassin bugs that prey on pest insects and their eggs, and cochineal scales that produce dyes. In Mexico and parts of South-East Asia, Hemiptera are even served as food for humans. A few others are parasitic, like the bed bugs Cimicidae that bite and feed on human blood. The bronze orange bugs, Tessaratomidae release foul-smelling toxic defense chemicals that can cause burns on the human skin.



Left: Galls by hoppers on *Hopea odorata*
Right: Mealybugs on Chili

There are many ways to collect Hemipterans for study or identification. Techniques include using traps, nets, vacuum or just collecting them by shaking infested plants. The hard-bodied insects are pinned whereas the soft-bodied ones are preserved in 70% to 80% alcohol. Scale insects, whiteflies and aphids are slide-mounted, as their features for identification are only visible in cleared specimens to be examined under a compound microscope.



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The aim of this bulletin is to disseminate horticulture and plant health information to plant growers, exporters and importers in Singapore. If you have any suggestions, comments or enquiries, please contact us at :

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