



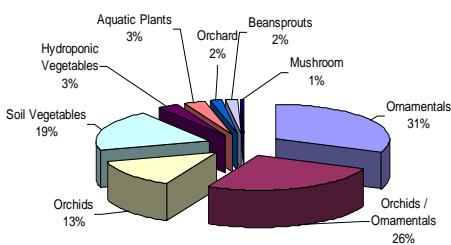
IN THIS ISSUE

- Horticulture Production, 2006
- Annual Floriculture Trade, 2006
- Phytoplasma Disease on Turfgrass
- Reduce Phosphorus Application in High P Soils

Horticulture Production 2006

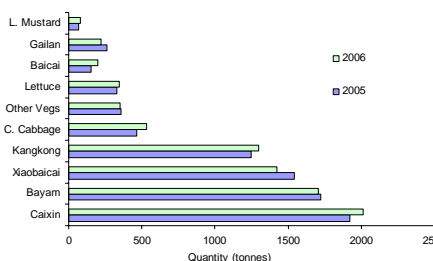
Singapore has 153 farms occupying a land area of 434.3 hectares (ha), of which 116.8 ha (66 farms) is for vegetable and foodcrop production while the remaining 317.6 ha (87 farms) is for orchid and ornamental plant production. The percentage area of land used for each type of horticultural production is shown in (FIG 1).

FIG 1 : LAND AREA FOR HORTICULTURAL PRODUCTION (%) IN 2006



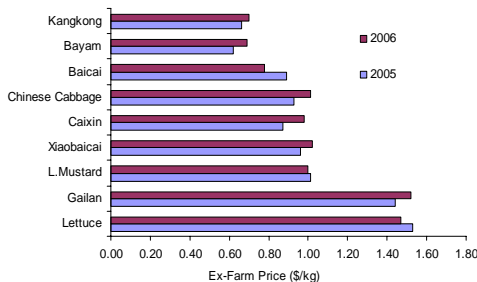
In 2006, a total of 18,077 tonnes (ton) of vegetables and foodcrops with a value of \$16.4 million (mil) were produced. These mainly consisted of beansprouts (53%) and vegetables (47%). Similar to last year, caixin, bayam, xiaobaicai, and kangkong accounted for 79% of the total quantity of leafy vegetables produced (FIG 2).

FIG 2: TYPES AND QUANTITIES OF LEAFY VEGETABLES PRODUCED



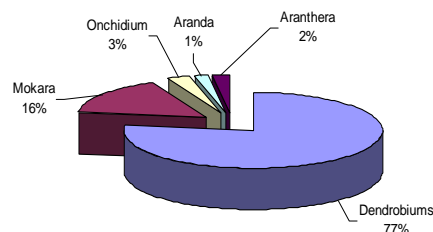
Ex-farm prices of leafy vegetables were slightly higher in year 2006 than in year 2005, particularly for caixin and xiaobaicai, which both increased by about 12% (FIG 3). This was possibly due to shortage of supply from Malaysia caused by heavy rainfall at the end of last year.

FIG 3: EX-FARM PRICES OF LEAFY VEGETABLES



Local farms produced about 10.1 mil stalks of orchid cut flowers and about 2.1 mil ornamental plants and 25.5 mil aquarium plants. *Dendrobium* orchid was the main type of orchid cut flowers produced, contributing to 77% of total orchid production (FIG 4).

FIG 4: TYPES OF ORCHID CUT-FLOWERS PRODUCED IN 2006



Annual Floriculture Trade 2006

Floriculture exports for 2006 decreased marginally to \$54.2 mil from \$56.8 mil (2005), while import of floriculture increase from \$75 mil (2005) to \$79.3 mil.

Total export of fresh orchids, orchid plants and cuttings to top destinations like Japan (\$12 mil), Australia (\$6.2 mil), US (\$1.5 mil) and Greece (\$1.4 mil) was 33% higher than 2005 (\$19.6 mil) at \$26 mil.

Export of other floriculture products such as foliages, branches, other flowers, live plants and plant parts dropped from \$23.3 mil (2005) to \$14.3 mil. Export of aquarium plants remained stable at \$13.9 mil.

Phytoplasma Disease on Turfgrass

Phytoplasmas are a group of plant pathogenic, phloem-restricted bacteria that are rapidly

Reduce Phosphorus (P) Application in High P Soils

emerging as the causal agent of many plant diseases with the availability of new molecular detection techniques. Many diseases caused by Phytoplasma are of great economic importance, in particular those of trees (coconut), perennials and high value vegetable crops. Phytoplasmas are transmitted from plant to plant by grafting and obligately transmitted by specific phloem feeding insects (Order Hemiptera) especially leafhoppers, plant hoppers and psyllids. Phytoplasma disease on turfgrasses is a new emerging disease in Singapore. White leaf symptoms (see photos) were first observed in *Cynodon dactylon* (Bermuda grass) in 2005 in Singapore. Subsequently, these were observed around the island and in other turf grass species.

The vegetable farms in Singapore apply around 400-450 kg of 15:15:15 NPK fertilizers per hectare per crop cycle. An average of 6-7 crops are planted per year adding, over 350 kg of phosphorus alone through these fertilizer applications. Chicken manure (with phosphorus content of >2%) is also added as a basal dressing in most farms. A joint survey conducted by the Soil Management and Horticulture Branches, AVA in 2005 found high soil phosphorus levels in vegetable farms. Regular use of mineral fertilisers and chicken manure over the years has contributed to the high phosphorus loading in the soil. The level of residual phosphorus in soils was assessed sufficient to support plant growth for many years to come, without further phosphorus addition.

A series of field experiments were carried out in AVA's research plots in 2006 to determine the effects of withholding phosphorus and the impact of repeated chicken manure applications on crop yield and phosphorus accumulation in soil. The experiment was repeated over four crop cycles. The research plots like those of the farms had high residual phosphorus from continual fertiliser applications. Results of experiments showed that yield of Caixin were not

affected by stopping phosphorus fertilizer application. Plots that received chicken manure had higher yield but these plots also accumulated more phosphorus in the soil. As chicken manure tends to add the phosphorus load in soil, other organic fertiliser with low phosphorus should be considered for organic matter instead.



Based on the results of these experiments, AVA recommends that phosphorus application for vegetable production be stopped in farms that have high soil phosphorus. This is a good and sustainable agricultural practice that also translates to savings from reduced fertilizer use without compromising crop yields. To find out the phosphorus level in your farm and fertiliser, you could send about half kg of soil, fertilizer or manure for analysis at the Animal and Plant Health Center (APHC), 6 Perahu Road. You can find out more about AVA's soil and fertiliser diagnostic services at AVA's web-site www.ava.gov.sg or contact the APHC service counter at Tel: 63165168.



Plant Bulletin is published biannually by the **Horticulture Working Group, Agri-Food and Veterinary Authority**,

Sembawang Research Station, 17km Sembawang Road, Singapore 769194.

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 :

Tel : 67519822 Fax : 67521244 (Horticulture Branch) Email : AVA_HSC@ava.gov.sg

Editorial Team : Mrs Lam-Chan Lee Tiang, Miss Poh Bee Ling, Miss Fadhlina Suhaimi.

Advisors : Mr Ong Keng Ho, Dr Yik Choi Pheng.

Contributors : Mr Wang Cheow Phen, Mr Thomas Tan, Miss Yap Mei Lai, Dr Varughese Philip, Miss Poh Bee Ling

Reference to a trademark, proprietary product, or company name does not imply product endorsement or recommendation to the exclusion of others that may also be suitable.