

Effect of fruit wrapping on the production and quality of some banana varieties

SCABS on banana peel caused by infestation of thrips (*Chaetanaphothrips* sp.), an insect pest, can bring the quality and price of banana down at the local and international market. Control of thrips can be carried out, among others, by wrapping the fruit and through pesticide injection. Wrapping was done from the time the sheath (*spatha*) of the first bunch started to bloom until harvesting time by using a blue plastic sheet perforated with a nail. Meanwhile, pesticide was injected into the stem of plant at about 10 cm from the base of the fruit stalk from the time when the first sheath bloom appeared. The pesticide applied was Basudin (75 cc each plant). The study was conducted for 4 years (1994/1995-1997/1998) in Cikelet, Garut, West Java (Indonesia). Split plot design with four replications was used in the study. In the main plot, Cavendish banana varieties C-36, C-57, C-59, and C-60 were grown. Meanwhile, subplots were designated for pest control of thrips including wrapping, insecticide injection, and control (without pest control). Results showed that among the four varieties tested based on

the average of 3 years research, C-36 was the highest plant (178.8 cm) having the biggest stem circle (48.7 Cm). Meanwhile, C-59 was the lowest one (102.2 cm) with the smallest stem circle (45.1 cm). For the weight per fruit and bunch, C-60 was the heaviest with 100.3 g/fruit and 12.6 kg/bunch. Wrapping the fruit was able to increase weight/fruit and weight/bunch, and also decreased thrips pest infestation. Wrapping, injection, and control treatments had average weight/fruit of 99.6 g, 85.4 g and 89.4 g, and weight/bunch of 12.9 kg, 11.3 kg and 11.5 g, respectively. Wrapping was able to reduce thrips infestation from 68.4% to 62.5% compared to the control and Basudin injection.

News source: **West Java Assessment Institute for Agricultural Technology, Indonesia**

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Increasing fertilizer efficiency with addition of organic matter in Andisols

ANDISOLS are volcanic soil having special characteristics, especially a high capacity for P adsorption. This characteristic causes inefficient P fertilization in this kind of soil, such that P deficiency often becomes a constraint for plant growth. The effect of organic matter addition in increasing P availability in Andisol, and the P absorption by corn and its effect on plant growth were studied. The study was carried out in the greenhouse using Andisol from Salatiga, Central Java-Indonesia, and the corn variety Arjuna. The mineral fertilizer used was ESP 36, and as an organic fertilizer, dung of cow was used. The P treatments included: 100% of P from cow dung as an organic fertilizer; 100% of P from ESP as a mineral fertilizer; and a mixture of both organic and mineral fertilizer with variation of dosage of half and full. Corn was planted up to 1 month age. For organic fertilizer

application, there were two variations of pH treatment namely constant and increased (pH constant and pH increased). Results showed that P fertilizer as an organic and a mineral matter increased all the parameters measured, such as plant height, shoot weight, and root weight (wet and dry). Addition of organic matter increased the efficiency of P fertilization as indicated by the agronomic efficient value and recovery value. The highest efficiency of fertilization was achieved by the fertilization dosage of 50 kg P/ha in the mixture of 50% dung and 50% ESP.

News source: **Indonesian Center for Soil and Agroclimate Research and Development**

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Biomolecular analysis of the 'kopyor' trait in coconut plants (*Cocos nucifera* L)

THE SPECIFIC nature of 'kopyor' on coconut plant is its abnormal fruit endosperm controlled by recessive gene (Kk or kk). Based on phenotypic characteristics, kopyor could not be differentiated from a normal coconut. The objective of this research was to identify the specific protein and DNA contained in kopyor coconut. RAPD analysis was done on 30 kopyor coconuts and six 'dalam' coconuts by using 20 random primers (10 and 23 mer) from Operon and abi. Results showed that among the tested primers, one of abi 117.15 was unable to amplify DNA from the whole plant, while primers of OPH04, OPH08, and OPD.05 produced monomorphic DNA fragment for all kopyor coconuts. Meanwhile, the other 16 primers produced polymorphic

DNA patterns with a molecular weight of 0.22-2.65 kb. It was found that there was a conservative DNA fragment with a molecular weight of 517 bp not present in normal coconut. It is possible that a DNA fragment of 517 bp is a potential STS with repetitive sequences of a certain nucleotide carrying the kopyor gene. It can be concluded that specific protein and DNA could be used as a marker for differentiating the kopyor to the dalam.

News source: **Indonesian Biotechnology Research Institute for Estate Crops**

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Effect of aeration rate on growth of hydroponic vegetables

THE GROWTH of Pakchoi and Chinese cabbage grown in deep water culture at different rates of aeration was investigated at the Tropical Vegetable Research Center, Kasetsart University. Vegetables were applied with different rates of aeration: continuous, 15 min/h, 15 min/2 h, 15 min/3 h, and without aeration. The solutions treated with continuous aeration had higher

oxygen level than the others. The highest dry weights of Pakchoi and Chinese cabbage were obtained when grown in solution with 15 min/h or 15 min/3 h aeration.

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Cell immobilization of *Kluyveroyces marxianus* CBS 6556 culture on local inulin substrate to produce inulinase

INULINASE is one of the enzymes produced by many microorganisms grown on inulin substrate. Inulin is used as a carbon source obtained from plants, especially those belonging to the family Grammineae, such as *Elephantopus spicatus*, *Crinum asiaticum*, *Hymenocallis hybrid*, *H. americana*, and *Dahlia* sp. Immobilization cell of *K. marxianus* CBS 6556 was prepared to produce inulinase on the medium containing local inulin derived from the tuber of *E. spicatus*. Sodium alginate was used as an entrapping material of *K. marxianus* CBS 6556 cells. Results showed that immobilization cell with a composition of 10 g Na-alginate and 5 ml yeast suspension was the best concentration. The enzyme activity produced by these immobilization cells on mineral salt medium reached 10.13 unit/ml after 48 hours of incubation at 40°C. Based on this result, local inulin medium was used as a single carbon source in an airlift fermentor. Inulin purified from the tuber of *E. spicatus* showed the best results. Enzyme activity was 5.48 unit/ml after 48 hours incubation with protein content of 0,16 mg/ml and a specific activity of

31.75 unit/mg proteins. Meanwhile, the inulinase activity produced using free cells reached 23.92 unit/ml with protein contents of 0.28 mg/ml and a specific activity of 85.08 unit/mg proteins. The enzyme activity produced by the free cells was four to five times higher compared with that produced by immobilized cells. However, immobilized cells could be used several times continuously. The use of free and immobilized cells grown on local inulin medium and their enzyme activity was also discussed.

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