

Processing and utilization of oil Palm by-products as livestock feed

THE DEVELOPMENT of the ruminant industry in Malaysia (beef and dairy cattle, sheep and goats) depends greatly on the availability of moderately priced local feed resources, particularly the fiber components. The oil palm industry provides an abundant supply of fiber from fronds, trunks, empty fruit bunches, palm oil mill effluent, palm kernel cake and palm press fiber. Current use of these fiber by-products, especially palm kernel cake and oil palm frond, has been extended to feed for dairy and beef cattle, sheep and goats. By chopping, drying, cubing and pelletizing, oil palm fronds can be transformed into an attractive source of ruminant feed, while oil palm trunks are a readily available

source of fiber in feed. Oil palm fronds, used either alone or combined with other ingredients such as palm kernel cake and palm oil mill effluent, have been successfully transformed into feed in pellet or cube form for ruminant animals. Beef cattle fed a diet based on oil palm byproducts gained between 0.5 to 0.7 kg per day in feedlots. Such feeds are also suitable for the maintenance of dairy cows. Beside fulfilling the country's requirements for roughage feeds, oil palm fronds in pellet or cube form are a good export prospect.

News source: **MARDI, Malaysia**

For further information: E-mail: pghlr@mardi.my

Single-node bamboo cuttings

PLANTING stock of bamboo species, such as *Bambusa blumeana*, *B. blumeana* var. *luzonensis*, *B. vulgaris* and *Gigantochloa levis*, may be produced on a large scale using single node culm cutting technology. Researcher Jose Agustin of the Mariano Marcos State University found that single-node culms are suitable for large-scale production of planting stock. They have a high survival rate, and are economical and easy to produce. Bamboos are effective planting materials in upland areas, in cogon (*Imperata cylindrica*) grassland and in highly degraded areas, such as those which have been used for slash-and-burn. Unlike tree seedlings, bamboo can grow well in such areas because it belongs to the grass family and can compete successfully with cogon. Bamboo is a fast-growing species even in severely eroded soils.

The steps to follow in the single node culm cutting technology are: Select planting materials from one- to two-year old culms. Cut culms with well-developed buds or branches into one-node sections. Set them out in a misting bed of pure, fine river sand. After 15-25 days, put the rooted cuttings in polyethylene bags filled with ordinary garden soil and sand. Place under partial shade. After two months, put the seedlings out in the open for hardening. Apply NPK fertilizer to facilitate growth. Plant the seedlings after one year.

News Source: **The Philippine Council for Agriculture, Forestry and Natural Resources Research and Development**

For Further Information: Bamboo-One Node Culm Cutting Technology, Information Bulletin No.84.
E-mail: pcarrd@ultra.pcarrd.dost.gov.ph
fax: (63) (49) 536-0016

Primary evaluation of genetic diversity of citrus by RADP-PCR

USING THE RADP-PCR method, the genetic diversity of 8 orange cultivars, 4 mandarin cultivars and 3 pummelo cultivars was analysed. Most of these citrus fruits were found to be genetically highly diverse. The cultivars are probably the result of natural crossing.

Twenty-four random primers were used in RADP reaction with DNA genomes from these 15 citrus cultivars. CTR 2, SPA 19, DER 10 and LY F8 were identified as primers to be used for detailed analysis.

Thirty-three random amplified DNA fragments were obtained with 4 primers from genomes of oranges, mandarins and pummelos. The size of the DNA ranged from 0.4 to 2.3 kb.

Of the 33 DNA fragments, 25 (80%) were monomorphic and present only in a single orange cultivar. The percentage of random amplified polymorphic DNA of the orange cultivar was only 20.

No RADP was obtained with LY F8 and DER 10 primers. Thus, it was concluded that orange cultivars are genetically highly diverse, with a low homologous coefficient (0.5946-0.8095).

Cultivars of mandarin and pummelo were also found to be genetically highly diverse. The percentage of monomorphic DNA fragment of mandarin was 54, and that of pummelo was 75.

The RADP-PCR technique was found to be effective for identifying the origin of crosses, and for the selection of parents for heterosis with high quality.

News source: **Department of Agriculture and Forestry Extension, MARD**

For further information: Journal of Agriculture and Rural Development. No 5. 2001.

Production of transgenic pigs harboring the human erythropoietin gene

THE USE of transgenic animals to produce human proteins of biomedical importance is an area in which considerable research efforts are currently being made. The strategy is to target the expression of the appropriate gene in the mammary gland or urinary bladder, and to harvest the product from the milk or urine. The therapeutic proteins, including human interleukin-2, α 1-antitrypsin, tissue plasminogen activator, protein C, blood clotting factor VIII and human hemoglobin, can be produced in transgenic farm animals and have the potential to reduce the cost of production. The animal bioreactor systems have demonstrated, mostly through empirical studies, that almost any desired protein can be obtained from mammary glands. In healthy individuals, natural erythropoietin (EPO), a glycoprotein produced by the kidneys, circulates through the blood stream to the bone marrow, where it stimulates red blood cell

production. Red blood cells perform the essential function of transporting oxygen throughout the body. When the kidneys fail, the production of erythropoietin ceases, and the production of red blood cells is also hindered, usually resulting in anemia. Transgenic pigs harboring the human erythropoietin gene (hEPO) were created in this study. These transgenic pigs produced human erythropoietin in their milk at a rate of up to 58,000 IU per milliliter. The genes were constructed by a fusion of the genome for human erythropoietin inserted into the mouse whey acidic protein gene. The results demonstrated that the desired protein could be produced in mammary glands in transgenic pigs, and reduce the cost of processing useful human proteins.

News source: **National Livestock Research Institute, RDA. Suwon 441-707, Korea**

For further information: E-mail: changwk@rda.go.kr