BSES Advancing Sugar

FACT SHEET

FS98002

Gene gun used for introducing new genes into sugarcane cells.

GENETIC ENGINEERING

IN THE SUGAR INDUSTR Y

SPECIFIC CHARACTERISTICS

Introducing specific characteristics, such as disease and pest resistance, into superior cane varieties is one of the Bureau of Sugar Experiment Stations' (BSES) main objectives. Progress in this area will lead to a more competitive industry through the development of the best possible varieties.

HIGH PRIORITY

High priority is given to genetic engineering by BSES. Genetic engineering allows genes to be introduced into superior varieties. This technique could result in previously disease and pest-susceptible cane varieties becoming disease and pest resistant.

CONVENTIONAL BREEDING

Due to the genetic complexity of cane plants, the use of conventional breeding techniques for the introduction of specific genes is very difficult. Genetic engineering can overcome this obstacle and at the same time retain the characteristics of superior varieties.

THE GENE GUN

Until recently, no suitable method existed for introducing new genes into sugarcane cells. However, a practical method for achieving this has been developed by a research team at the University of Queensland (UQ) in conjunction with BSES. The method involves the use of a gun which fires (bombard) genes into plant cells. Following bombardment, plant cells which express the introduced gene are selected and plantlets regenerated from these cells.

GENE DEVELOPMENT

There are a number of sugarcane characteristics which could be modified using genetic engineering techniques. For instance, a gene for resistance to sugarcane mosaic virus has already been developed at BSES. Genes for resistance to Fiji disease and genes to increase tolerance to canegrubs are currently being developed and evaluated. Researchers are in the process of introducing genes into sugarcane varieties. However, it will be a number of years before these varieties are available commercially.