SETTING THE SCENE

KJ NUSS

South African Sugar Association Experiment Station, Mount Edgecombe

In his opening address, the President of SASTA mentioned the interaction of biological and a biological factors we have to deal with. I wish to mention the practical constraints and challenges facing our industry in future.

The SA sugar industry is producing sugar economically despite a number of constraints. Some of the reasons for being an efficient and successful producer include

- the climate is ideal for ripening of the cane; the temperatures are moderate to cool in autumn and winter and the rainfall is usually high in the warm summer months and lower during autumn and winter
- with the early ripening the industry can have a long milling season, regularly extending from April to December
- prior to eldana, low sucrose varieties produced acceptable sucrose contents because the cane was 18 to 24 months old and sufficiently mature to have good milling traits
- modern sugarcane hybrids, starting with the release of NC0310 in 1945, and subsequent ones, are able to produce acceptable yields of sugar in these marginal conditions.

Present constraints to greater sugar yields

Climate

The mean rainfall of the rainfed areas is about 900 mm per annum, compared to Queensland in Australia and Sao Paulo in Brazil of more than 1 500 mm and 1 250 mm, respectively.

The frequency and intensity of droughts (such as the three in recent years) which reduced the total crop by up to 35%.

The supply of irrigation water is limited in those areas that can be irrigated.

Temperatures are moderate for a tropical crop; not excessively hot in summer and cool to cold in winter.

The option of importing varieties and expecting them to yield as well as in the country of origin does not work in practice, as almost all imported varieties are not adapted to local irrigated conditions, let alone rainfed areas and droughts.

Diseases

The major disease affecting cane yield is RSD. In addition smut, mosaic and rust are serious diseases and commercial varieties have to be resistant to them.

There are a number of minor diseases such as gumming, Pokkah boeng, brown spot and red rot, and these are controlled through resistance.

Pests

Eldana is a major limiting factor in improving sucrose yields. It infests cane that is older than 12 months and the sucrose content of infested cane is significantly lower. All cane in the areas where eldana occurs has to be harvested before the sucrose yield has peaked, thus reducing the profitability in these areas.

Challenges for researchers

- To obtain more information on the genetic control of important traits so as to breed a new generation of varieties
• To monitor disease and pest evolution so as to screen varieties in advance for potential epidemics.
• To improve screening procedures by using biotechnology, and insert genes with relevant promoters to improve quality and resistance traits.
• To be able to model the crop so that all agronomic problems can be solved using computers.