The world’s sugar industry has already made attempts to report on, and to stimulate, small factory processing. For example, the Conference on Small-scale Sugar Processing was reported in Zuckerindustrie 112(1987), 11, 970–971, by Hagelberg. However, as far as I know, today’s symposium is the first time that an attempt has been made to take the equivalent overview of the mechanization of small cane farms. “Small” is defined as less than 5 ha.

There are perhaps 300 million tons of cane produced by such farms. Indeed some very large factories (e.g. India, Fiji) draw their cane exclusively from small farms. Others (“Nuclear” estate organizations) take over 80% of their supply from small farms. In other cane industries the proportion of cane from small farms may be lower, but is high enough that the factories would go out of business if the small farms stopped producing. Finally, there is a growing number of small cane farms whose cane never enters a large factory at all but is used on the farm itself for animal feed, or for production of non-centrifugal sugar, syrups, rum, etc.

Many small farms are finding increasing difficulty in growing and reaping their canes without mechanical help of some sort. In many cases this is due to the farm size being too small to generate the family’s total income and “part-time” cane farmers are perhaps the largest group requiring mechanical help at this time.

PURPOSE OF THE SYMPOSIUM

This Symposium is being held in response to requests at the last ISSCT Congress from delegates with significant proportions of their cane coming from small farms. These delegates felt that:

a) The lack of suitable mechanization for smaller farms was becoming a significant problem in at least some countries.

b) That ISSCT was concentrating too much on “big mechanization”. This is correct – there has not been a single paper in the last 20 years devoted exclusively to small farms, though five could be counted as somewhat relevant.
Mechanization of small sugarcane farms in Thailand may vary from one area to another. A typical scenario could be selected from the cane-growing areas in the northern parts of Thailand.

In the northern cane-growing area, an average sugarcane farm size is 4 ha and the farmers do not own tractors. As a result, the small cane growers ignore ratoon maintenance after harvest which will then require high labor cost and expenses derived from hiring tractors of over 50 HP capacity. The hire tractor would also refuse to do the job due to its being uneconomical. These problems lead to low yield and poor quality cane.

Cane technologists together with extension workers in the areas and sugar factories have thus resorted to the solution of these problems. One of which was to provide hire tractors in the neighborhood in addition to encouraging cane growers to use draft animal (buffalo) and hand or "walking" tractors. Even then the operation is still time-consuming. The use of draft animals and/or "walking" tractors has to be carried out four times instead of three by the high power tractors which are for:

1. Ratoon shaving or stool topping,
2. Fertilizer application and subsoiling, and
3. Top soil scattering with small tractors.

The use of hire tractors has to be abandoned finally. The owners find it uneconomical because in having a capacity to perform the job covering 6 ha in one day, each tractor had to do the job covering 4 ha, thus 30% loss. In addition, each farm is also located too far away from each other. To perform the three functions, it will thus take three days instead of only one day.

The four-purpose ratooning machines developed by the cane growers have reduced the expenses tremendously because the machine could serve all the purpose required when being operated, namely,

1. Subsoiling,
2. Ratoon shaving or stool topping,
3. Fertilizer application, and
4. Harrowing and weeding.
CONCLUSIONS

I. On time-taken for ratoon maintenance:

- It takes 4.38 days per ha when hand and small tractors are used.
- It takes 1.9 days per ha when tractor is used conventionally.
- It takes the 4-purpose ratooning machine only 0.2 day to cover one ha.

II. Cost of ratoon maintenance:

While the cost of ratoon maintenance was as high as 2,874 baht (US$115) per ha when the hand and small tractors are used, it cost 1,937 baht (US$77) per ha with tractor used conventionally. But when the 4-purpose ratooning machine is used it cost only 875 baht per ha (US$35).