Big effort was expended in improving the random-mating of sorghum populations NP 3R and NP 68, introduced from Nebraska, USA. Grid or controlled mass selection (female choice) (1) at the high selection density (approx 3%) gave encouraging results. However, the improved population is tall and has brown seed, which is unfavourable.

Hegari sorghums which have been widely grown (more than 95%) by the Thai farmers since 1955 are incorporated in the NP 3R for constituting the Hegari random-mating population with white grain which will be improved by a recurrent selection scheme for grain yield, disease and insect (especially stalk rot and shoot-fly) resistance, and grain characteristic. Hegari collections from the farmers are slightly different in their performance; most of them are late or photoperiod sensitive. Therefore, they are suitable for planting following corn during the late rainy season (mid-Aug. to mid-Oct.). Seed size is not as large, however, as that of the Sudan sorghum exported to Saudi Arabia; therefore, the large-seed Sudan sorghum was introduced for preliminary study. Its performance is quite interesting but it is rather susceptible to foliar diseases and is tall, and thus susceptible to lodging. A hybrid with brown seed from Martin (red seed) and Early Hegari (white seed) yielded quite good, but it was tall and susceptible to lodging.

P 721 is a high-lysine line introduced from Purdue University, USA in 1974. The grain is relatively high in feed value as it has high oil content and expectedly high lysine content. It is very susceptible to foliar diseases such as rust, especially under humid condition. In addition to the occurrence of high outcross frequency, its yield is as low as other unadapted materials, such as the waxy Texpoca 63. Based on the preliminary chemical analysis and tests, P 166080 might be a good source for high-feed-value sorghum, because it also has relatively high oil and protein contents and is expected to be relatively rich in lysine, too.

Yellow endosperm with white pericarp lines extracted from ICRISAT's diallel crosses are quite interesting; they yield well under a relatively wide spacing, but they are as late as other yellow endosperm lines. Putatively-native sorghum (shallu type), which is daylength sensitive, has the pale yellow corneous endosperm and small-seed demanded by the Japanese market.
(500 tons a year), but it is not suitable for big-scale farming as its yield is not as high as the widely grown Late Hegari, especially for late planting due to limited vegetative growth before flowering.

Results from plant-spacing experiments encourage planting sorghum at the 60-cm row spacing instead of 75-cm row spacing. However, farmers still broadcast sorghum after plowing only one time, and only few farmers mix sorghum with mungbean for broadcasting after harvesting corn and plowing the land. Sorghum growing in Thailand should be the Late Hegari variety planted during mid-August to mid-October under rain-fed conditions. Planting earlier than this period should be done by using the Early Hegari, which expectedly is non-photosensitive. Although results from fertilization trials indicated a yield response to nitrogen fertilizer, it seemed not practical to apply fertilizer due to a poor net return.

PROBLEMS

The improved cultivars are generally late and perform poor under unfavourable conditions such as low soil fertility or poor management. A combination of good yield and other good characteristics (such as grain quality) is rare; therefore "improved" cultivars are not likely to be accepted by farmers.

References