

## RECENT ACHIEVEMENTS OF RESEARCH ON CASHEW

Vietnam became the biggest cashew kernel exporter in the world in 2010. The export value was over USD one billion and ranked fourth export crop after rice, rubber and coffee. However, more than 50 percent of raw nuts were imported from Africa, Indonesia and Cambodia. To ensure raw materials for processing and to improve the economic efficiency of the cashew industry, essential and highly effective solutions are needed to continue cultivar improvement and development of advanced farming techniques suitable for the main growing areas. The cultivar

improvement program focused on selection of high yielding cultivars of 2.0 to 2.5 tonnes/ha for the Southeastern (SE) and Central Highland (CH) Regions and 1.5 to 2.0 tonnes/ha for the South Central Coastal (SCC) Region. New cultivars have a high nut quality with big nut size (less than 170 nuts/kg) and kernel recovery rates of over 28%. Advanced farming techniques were developed that were suitable for the agro-ecological conditions of the different growing areas of the SE, CH, and SCC Regions. The following results were obtained during the period of 2006-2010.

### CULTIVAR IMPROVEMENT

Of 165 investigated mother trees, 14 elite trees were selected in three main agro-ecological regions.

- The Southeastern Region: AV1, AB29, TXM3, TXM5, and TXM11; high and stable yields of 30 kg/tree, nut sizes of 160 nuts/kg and kernel recovery rate of 28 to 31.5%.
- The Central Highland Region: TN01, TN10, TN13, and TN18; nut yields of 21-50 kg/tree, nut sizes of 111 to 140 nuts/kg and kernel recovery rate of 28.9 to 31.1%.
- The South Central Coast Region: B10, B37, B29, K01 and K05; nut yields of 24-43 kg/plant, nut sizes of 170-180 nuts/kg and kernel recovery rate of 29.0 to 33.0%.

Five promising clones were selected in yield trials. They included the three clones AB10, AB20, and ABU15 in SER, one clone, ES-04, in CHR and one clone, DH224-146, in SCCR. The yields varied from 110 to 305 kg/ha with nut sizes from 170 to 180 nuts/kg, and kernel recovery rate of 28%.

Four promising cultivars were selected in regional yield trials. Three varieties TL2/11, TL6/3, and TL11/2 gave high yields ranging from 2.0 to 2.6 tons/ha with nut sizes of 160 nuts/kg, and kernel recovery rate ranging from 28 to 32% in SER. The yield of DDH102-293 varied from 1.5 to 1.6 tons/ha with nut sizes of 170 nuts/kg, and kernel recovery rate ranging from 29 to 33% in SCCR.

### ADVANCED FARMING TECHNIQUES

Proper pruning methods improved canopy structure of cashew trees, increased the

number of flowering panicles, and reduced pest damage, resulting in yield increments

of 30-50%. Bio-organic fertilizers containing 23% organic matter + 4% N+ 2% P<sub>2</sub>O<sub>5</sub> + 2% K<sub>2</sub>O showed good effects on cashew growth and development on both red soils and grey soils. Recommended doses of inorganic fertilizers were 150 g N, 120 g P<sub>2</sub>O<sub>5</sub>, 90g K<sub>2</sub>O/tree/year, and 150 g N, 180 g P<sub>2</sub>O<sub>5</sub> and 60 g K<sub>2</sub>O/tree/year in SER and CHR, respectively. Bio-organic fertilizers combining with inorganic fertilizers of 180 g N -100 g P<sub>2</sub>O<sub>5</sub> - 60g K<sub>2</sub>O had good effects on cashew in grey soils in SCCR. Spraying GA<sub>3</sub>, Zn, Bo and the foliar fertilizer of NPK (6:30:30) increased the percentage of fruit setting and nut quality. As a result, the nut yields increased 40-60 %; and the revenue and profit increased 25% and 33%, respectively.

Sixteen major insect pests were found belonging to six orders and 12 families.

They included six species of insect pests in nurseries and 11 insect species in mature cashew orchards. Among the five major cashew insect pests, tea mosquitoes (*Helopeltis theivora* and *H. antonii*), the stem borer (*Placaederus obesus*) and the shoot borer (*Alcidodes* sp.) were the most important ones. Of nine fungus diseases causing damage on cashews, anthracnose (*Colletotrichum gloeosporioides*) was the most important one. Use of pesticides during leaf flushing, flowering and fruit setting reduced pest damages by more than 85%. Application of advanced farming techniques and integrated pest management reduced pest damage and improved nut yield; consequently revenue and profit increased by 40% and 50.5%, respectively.



Photo 1. The promising cashew clone AB29



Photo 2. The promising cashew clone ABU15