INTENSIVE CULTIVATION PACKAGE FOR ROBUSTA

The average productivity of robusta in Chikmagalur region is around 1400 kg/ha. which is higher than the average national productivity. However, there are estates with high productivity level of 2.5 MT/ha. which indicates high potential of robusta in the region, if intensive cultivation is adopted. Hence, a package for intensive cultivation of robusta coffee suited to the region is suggested. In intensive cultivation, irrigation is a prime requisite to achieve desired results. Hence, adequate water resources and infrastructure for irrigation should be set up.

Planting material

- ❖ Use clonal planting material (rooted cuttings) of varieties like S.274 or CxR.
- ❖ Interplanting with dwarf arabica varieties like Cauvery could be taken up to realise early returns. However, Cauvery should be phased out once robusta is established.

Consolidation of holdings

- ❖ Block wise vacancy filling with clones of same variety.
- ❖ Top working of off-type plants, if such plants are not too many.
- ❖ Replanting of old unproductive blocks in a phased manner.

Soil management

- ❖ Enriching the soil organic matter in the initial years of planting through green manure crops like *Crotalaria, Tephrosia*, cowpea, horse gram etc. Green manure crops should be sown during May-

June and incorporated into soil before flowering.

- Cover digging during first year and scuffling during next 2 to 3 years help in weed suppression as well as soil moisture conservation. However, in sloping terrain avoid digging and scuffling.
- Avoid soil cultivation like digging and scuffling in established fields. However, when root matting is noticed, especially in irrigated fields, root pruning could be adopted by scuffling or forking.
- Taking up cradle pits/trenches in staggered manner across the slope in established fields conserves soil and moisture.
- Mulch the base of young plants with dry leaves for conservation of moisture during dry months.

Bush Management

- In estates with closely planted old robusta, eliminate unthrifty plants that do not fall in regular rows to maintain optimum plant population.
- The bushes, which have lost framework, should be hard pruned followed by 1 or 2 rounds of handling to re-establish the framework.
- Regular light pruning after harvest followed by handling, desuckering and removal of shot hole borer affected twigs should be practiced.
- All gourmandisers should be invariably removed. In case allowed do not retain them for more than one crop.

Shade management

- Maintain optimum shade by regulating the population of shade trees to 75-100 per ha.
- Light shade regulation every year after harvest and before blossom irrigation.

Weed control

- Cover digging during the first year of planting and scuffling during the next 2-3 years would help in suppression of weed growth.
- In established fields, integrated measures of weed control involving pre-monsoon weedicide spray, mid-monsoon slash weeding and post-monsoon weedicide spray will give satisfactory weed control.
- In case of chemical weeding, use contact (Gramoxone @ 500 ml/ barrel) and systemic (Glycel or Round Up @ 600 ml/barrel) weedicides in a rotation, in combination with Urea @ 2 kg/barrel to control all types of weeds.

Nutrition

- Apply organic manures (FYM/Compost) @ 10 tonnes/ha once in 2-3 years.
- Soil testing should be done once in 2-3 years for liming and fertilizer application.
- In irrigated blocks, apply recommended dose of fertilizers in 4 splits (pre or post-blossom/ pre-monsoon/ mid-monsoon/ post-monsoon) by broadcasting. While broadcasting, mulch should be heaped near to coffee plant base and spread back later. In unirrigated blocks, application in 2-3 splits is suggested.
- Water soluble phosphatic fertilizers like DAP/ Super phosphate are to be given during pre or post-blossom application and citrate soluble phosphatic fertilizers (rock phosphates) during the remaining rounds.
- Application of Calcium sulphate or Magnesium sulphate @ 125 kg/ha during post-monsoon period will improve the quality of arabica.

Foliar nutrition

- When the yield level is around 2.5 tonnes/ha. give a foliar spray with nutrients and growth regulators (1 kg urea, 1 kg SSP, 0.5 kg MOP and 50 ml of Planofix or Hormonal per barrel @ 3 barrels per acre) during post-blossom period.

Watershed management

Watershed management includes conservation and harnessing of rainwater in plantations to build-up water resources.

- Taking up cradle pits/trenches in staggered manner across the slopes help in recharging of water bodies.
- Construction of check dams or farm ponds in low-lying areas to store rainwater, which can be used for irrigation/processing purposes.
- Opening up of drainage channels in flat areas and connecting them to a catchment pit and then diverting the water to check dams/farm ponds.

Irrigation

- Irrigation may be provided to young coffee by sub-soil injection method (2 l/plant once in 15 days) during the dry period.
- Blossom irrigation @ 40-50 mm for blossom during Feb-March.
- Backing irrigation @ 25-40 mm at 20 days after the blossom irrigation. Repeat backing irrigations at every 20 days interval if natural rains fail.
- In areas where the water resources start depleting by Feb-March, winter irrigation with 40 mm water at 20-25 days after last monsoon showers could be recommended in some blocks to utilise the inflowing water during November-December. Such winter irrigated blocks can be left for natural blossom showers.

The water that is stored in check dams/farm ponds after December could be utilised for timely blossom irrigation to the other blocks. By this manner, some blocks could be irrigated during winter months and some blocks for blossom and backing, thus bringing more area under irrigation.

- In winter-irrigated blocks, an additional round of fertilizers @ 10:5:10 kg NPK/ acre may be given to support increased vegetative growth and flower bud induction.

Drought amelioration measures

In areas with delayed blossom/ backing showers and in blocks where irrigation is not feasible due to water scarcity or other problems, the effect of drought could be minimised by giving foliar spray of nutrients containing 1 kg urea, 1 kg SSP, 750 g MOP and 1 kg Zn SO_4 per barrel. The first spray should be given 45 days after the last major rainfall and second spray 30-45 days after the first spray. If blossom showers are delayed one more spray could be given 30-45 days after second spray.

Pest management

Shot hole borer

- Maintain optimum shade.
- Provide proper drainage to reduce humidity build up
- Regular tracing and burning of affected branches during pre-monsoon (April-May) and post-monsoon (Sept.-Dec.) seasons.
- Remove all the suckers and destroy as they harbour the pest.
- In young non-bearing plants, spray with Lindane (650 ml/barrel) could be suggested.

Mealy bugs

- ❖ Build up adequate shade in open patches, which are endemic for infestation.
- ❖ Control ants by dusting Ekalux 1.5% or Folidol 2% or Malathion 5% dust around the base of coffee bushes and shade trees. Destroy ant nests.
- ❖ Control weeds.
- ❖ Spot application of Ekalux 25 EC (300 ml/barrel) or Folithion 50 EC (300 ml/barrel) or Lebaycid 1000 EC (150 ml/barrel) or Kerosene emulsion 2% (4 L/barrel) along with wetting agent @ 200 ml/barrel. While applying Kerosene emulsion, the spray solution should be stirred constantly for proper emulsification.
- ❖ The parasitoid *Leptomastix dactylopii* could be used for bio-control.
- ❖ For controlling root mealy bugs, drench the soil near root zone with Rogor 30 EC @ 3.3 ml/L.

Coffee Berry Borer

As Chikmagalur region is free from coffee berry borer, the following precautions may be taken to prevent its possible entry.

- ❖ Do not procure seeds from berry borer affected areas.
- ❖ Do not transport berry borer affected coffee into these zones.
- ❖ Use only new gunny bags for packing the harvested crop.

Disease management

Root diseases

- ❖ Isolation of affected bushes including one row of surrounding bushes by trenching.

- ❖ Uprooting of affected bushes and application of agricultural lime @ 2 kg per pit and mix thoroughly with soil. Fallow the affected spots for 6 months.
- ❖ Drenching the base of surrounding bushes with 0.4% Bavistin solution (8 g/l) @ 3L/plant, during pre-monsoon.
- ❖ Application of FYM @ 10 kg along with *Trichoderma* to the surrounding bushes.

Black rot

- ❖ In Black rot endemic areas, mono shade of Silver Oak should be avoided as it aggravates the disease incidence. It is therefore desirable to maintain mixed shade of conventional trees at wider spacing.
- ❖ Thinning of shade, opening of cradle pits, cleaning of bushes by removing fallen shade tree leaves etc. should receive attention, prior to monsoon.
- ❖ Two rounds of handling and centering of bushes (pre-monsoon and mid-monsoon)
- ❖ When disease is noticed, clean the bushes by removing affected leaves, branches etc. and spray with 0.03% Bavistin (120 g/ barrel) during the break in monsoon.

Stalk rot

- ❖ Wherever the incidence of stalk rot is noticed in the previous year, spray with 0.5% Bordeaux mixture during pre-monsoon.

Inter cropping/ Mixed cropping

- ❖ Only pepper should be encouraged as a mixed crop in coffee blocks.
- ❖ Planting of areca nut and cardamom in valleys and coconuts in boarders is suggested.

Estate level processing

- Harvest the crop when more than 70% ripening is noticed.
- Use mats during harvesting to minimise gleanings.
- Sort out greens from ripe fruits and dry them separately.
- Do not heap harvested fruits for long periods, as it encourages mould growth and quality deterioration.
- Dry the fruits on concrete/tiled yards.
- Cover the cherry during night hours to avoid rewetting.
- Wherever possible prepare parchment coffee, by practicing appropriate effluent treatment methods, for value addition.
- When wet method is practiced, commercial pectinolytic enzymes like 'Speedox' (800g /tonne of clean coffee) and 'Coffeezyme' (2.6 l/tonne of clean coffee) could be used for enhancing mucilage degradation during fermentation without affecting the quality of coffee. However, use of enzymes for fermentation is not permitted in the processing of specialty and organic coffees.
- Overnight soaking of parchment in water would help in enhancement of quality.