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Critical leaf and rachis nutrient levels

Indicative critical leaf (L) and rachis (R) levels for oil palm.

YAP	% dry matter								mg/kg
	N		P		K		Mg		B
	L	R	L	R	L	R	L	R	L
3-7	2.9	0.55	0.19	0.09	1.1	1.4	0.27	0.07	15
8-15	2.6		0.16		1.0		0.26		
>15	2.5		0.15		0.9		0.25		

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Keys to leaf and rachis sampling

- **LSU palms** identified correctly (10 row x 10 palm grid of healthy palms, bar coded, georeferenced and mapped).
- Identify **Fronde 9** (2 YAP) or **Fronde 17** (≥ 3 YAP) correctly.
- Record **deficiency symptoms** (N, K, Mg, B, Cu).
- Correct **sample preparation** (drying, grinding).
- **Annual cross check on lab** for precision and accuracy.
- **Careful/cautious interpretation** of leaf analysis results.

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Treworgan Estate

Sampling Point



TRE#D01#045#15#10

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Use of Sampling Point QR cards

- Sampling points have many uses (e.g., leaf & soil sampling, pest & disease census, black bunch counts).
- The sampling Point QR card contains details of the palm position (Estate#Division#Block#Row#Palm number).
- The QR card can be read by the **Agrisoft Systems** smartphone app to reveal the palm point position and verify that the surveyor visited the palm.

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Pruning standards according to growth phase

Correct pruning standards are required to maximize yields.

Stage	YAP	Fronds	Spirals	Standard
IGP	1-2	No frond 'tipping', damage or removal.		
Remove all moribund and dead fronds before starting harvest!				
SAYP	3-7	48-56	6-7	2 subtending fronds
PYP	8-15	40-48	5-6	1-2 subtending fronds
DYP	>15	32-40	4-5	1 subtending frond

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Keys to correct harvesting and pruning technique

- Use chisel with 2 m shaft and 10 cm cutting edge for bunch stealing in 1st year of harvest.
- Use chisel with 2 m shaft and 14 cm cutting edge for harvest at ≥ 4 YAP.
- Change to sickle when it becomes more efficient for harvesters (t/md, ha/md) than chisel harvesting
- Cut fronds and bunches close to trunk and on the spiral.

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Keys to field assessment in all blocks

Check all blocks for the following parameters:

- Crop recovery, harvest access, and pruning.
- Fertilizer and crop residue application.
- Drainage, soil conservation and erosion.
- Ground cover (soft vs. hard weeds).
- Leaf + soil analysis and vegetative measurements data.
- Unproductive palm removal and inter-palm competition.

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Key palm measurements in selected blocks

- **Petiole cross section** (width x depth = PCS cm²).
- **Palm height** (m ground level to base Frond 41).
- **Palm diameter** (m \emptyset at 1.5 m from ground level).
- **Frond production rate** (fronds/palm/year).
- **Number of green fronds** (fronds/palm).
- **Stand per ha** (palms/ha).
- **Leaf area index** (*L*)

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Keys to large fruit bunch yields

- **Unimpeded access** from palm to mill (roads, paths, circles, correct pruning).
- **Complete crop recovery** (10 day intervals, 10 LF MRS).
- **Mineral nutrition** (apply mill residues and fertilizers).
- Two cycles of **pruning** (pre- and post-peak crop).
- Inter-row **ground cover** of LCP, soft weed and grasses.
- Adequate **drainage** (desilt drains every 4–5 years).

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Keys to high oil extraction rates

- Good access (roads, paths, circles).
- Sufficient harvesters (15 ha per harvester).
- 10 day harvest intervals.
- 10 loose fruit on the ground before bunch harvest.
- Collect all bunches and loose fruit
- Transport to mill within 12 hours.
- Grade crop in the field and at the collection point.

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Keys to ground cover management

Use biological, physical and chemical methods and soil fertility management to:

- **Eliminate noxious weeds** (e.g., *Dicranopteris linearis*, *Melastoma malabathricum*, *Imperata cylindrica*).
- **Nurture legume cover plants, soft weeds** and **grasses**.
- **Maximize utilization of pruned fronds** by arranging in box pattern between palms and between alternate rows.

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Keys to drainage maintenance

Maintain (and where necessary **install**):

- **Drain outlets** to take water away from the planted area.
- **Field drains** every four palm rows in low-lying areas.
- **Herringbone sub-field drains** as required.
- **Drain desilting** every 4–5 years.
- Check **position of culverts**.
- Spread **drain spoil** in palm inter-rows.

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Keys to efficient pesticide use

Check for the following:

- **Right chemical** to tackle the problem identified.
- **Right rate** (amount of active ingredient per sprayed area according to label recommendations).
- **Right method of application** (equipment, nozzle, pressure, walking speed, lance position).
- **Right time** for application (growth stage of weed or pest).

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Keys to efficient fertilizer and mill residue use

Check for the following:

- **Right type** (fertilizer and/or mill residue)
- **Right time** of application a/t weather conditions.
- **Right amount** and **accurate application** (actual is $\pm 10\%$ of recommended rate).
- **Right place** (N over circle, B & Cu in 0.5 m band in circle and 0.5 m from palm, P, K and Mg over the frond stack).

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Agronomic Information Management Systems (AIMS)

Agrisoft Systems provides customized database software for oil palm plantations:

- **OMP™** provides comprehensive storage and analysis for oil palm agronomy and management data.
- **Fertilizer Planner™** is a decision support tool for preparing fertilizer recommendations.
- **OMP-GIS™** provides mapping for parameters in OMP.

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