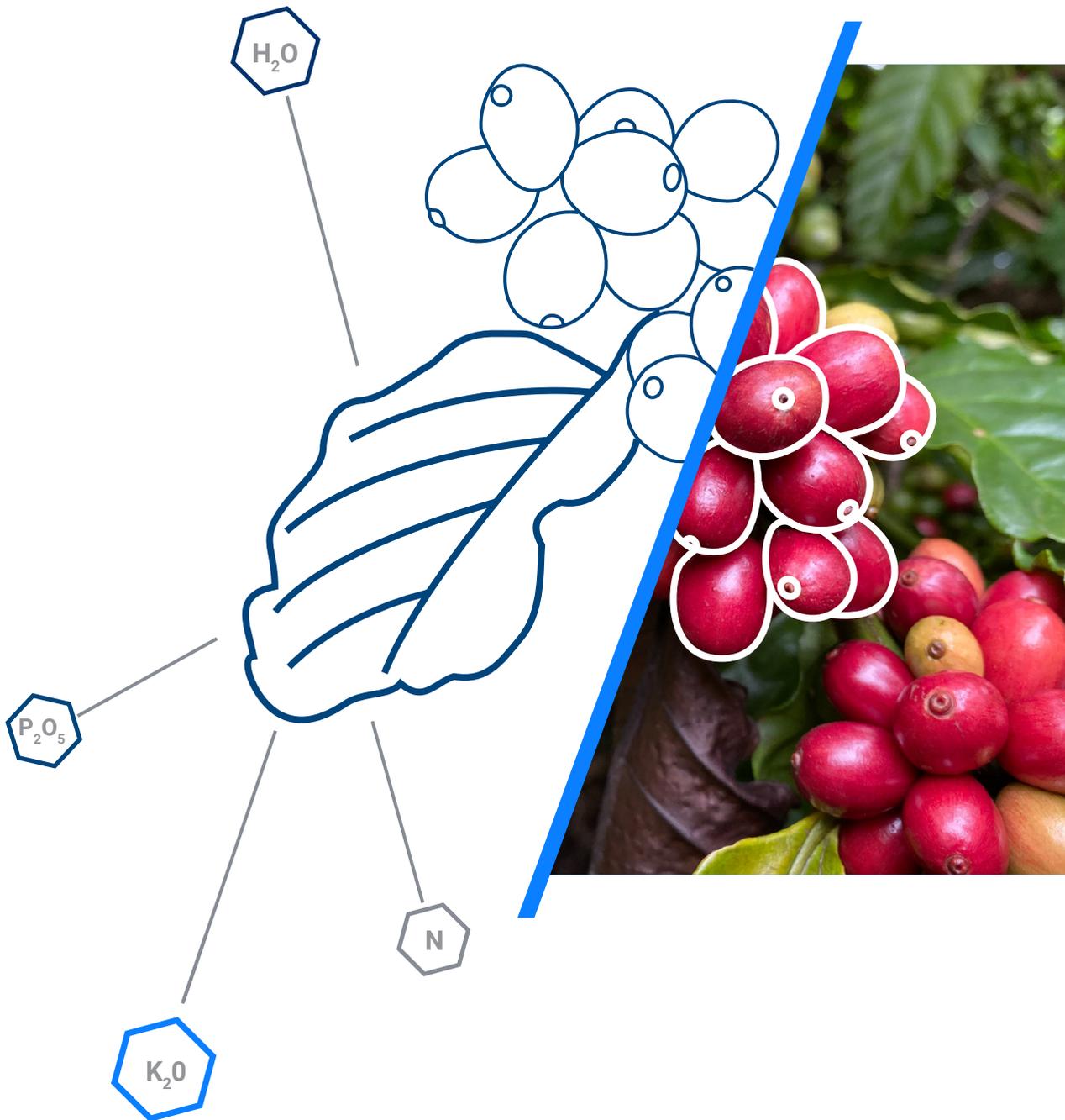


Coffee Arabica

/ Irrigation & Fertigation Guidelines



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Irrigation & fertigation of productive orchards

GENERAL GUIDELINES

The following are basic guidelines for the irrigation and fertigation of coffee orchards with an estimated yield of 3 t/ ha. It is recommended that you adjust your plan based on your specific local conditions related to soil type, climate, planting patterns and yield targets.

Irrigation principles:

- ✓ Coffee has a shallow root zone so frequent irrigation is important.
- ✓ Drip irrigation is recommended.
- ✓ Recommendations are based on no rain.
- ✓ Effective rain event is one over 10mm.
- ✓ Rain efficiency should be calculated at 60% rate.
- ✓ After a significant rain event you should resume irrigation when the topsoil layer starts drying. If the soil is sandy or when the climate is hot it can be resumed within 2-3 days. If the soil is heavy or during cooler periods it can be up to 7-8 days.
- ✓ Recommendations are intended for fully grown trees, if the trees are already productive but the canopy is not fully grown, you can reduce it by 10-20% of the irrigation quantity according to tree size.
- ✓ Convert mm/day or m³/ha/day recommendation to hours per shift/day by using the following formula:

$$\frac{\text{Dripper flowrate (l/h)}}{\text{Dripper spacing (m) x lateral spacing (m)}} = \text{application rate (mm/h)}$$

Example:

Recommended irrigation dose: 3mm/day = 30m³/ha/day

Dripper spacing : 0.5m

Lateral spacing : 4m (usually 2 laterals per crop row are used.

So typical lateral spacing is 3-4m)

Dripper flow rate : 1.0 l/h

$$\frac{1.0}{0.5 \times 4} = 0.5\text{mm/hour} = 5\text{m}^3/\text{ha/hour}$$

$$\frac{3\text{mm/day}}{0.5\text{mm/hour}} = 6 \text{ hours per shift /day}$$

Fertigation principles:

- ✓ Fertilization guidelines are based on the assumption that P and K levels in the soil are low-to-medium.
- ✓ It is recommended that you apply fertilizer in every irrigation so split the total amount for the relevant period into expected irrigation events.
- ✓ Fertigation should start only after the system is fully pressurized and stopped 30 min before irrigation is stopped.
- ✓ If you cannot fertigate every irrigation, it is recommended to fertigate at least once a week. During the rainy season, skip irrigation but do technical fertigation. Fertigate with a high concentration of fertilizer and a small volume of water.
- ✓ Coffee is sensitive to salinity. Do not irrigate with water that has EC levels above 1.5ds/m.
- ✓ The fertigation plan and amount is flexible and should change according to yield and to soil and leaf tests.

			Kc	N (Kg/ha/stage)	P ₂ O ₅ (Kg/ha/stage)	K ₂ O (Kg/ha/stage)
Stage 1	Pre-flowering: Bud swelling		0.5-0.7	20	5	20
	15 days					
Stage 2	Flowering: Onset of flowering until 80% anthesis		0.7	70	15	75
	30 days					
Stage 3	Fruit set		0.7	35	10	40
	30 days					
Stage 4	Fruit growth: Fruit enlargement and dry matter accumulation		0.7	160	40	190
	150 days					
Stage 5	Fruit maturation		0.7	50	12	5
	60 days					
Stage 6	Harvest		0.7	0	0	0
	30 days					
Stage 7	Stress induction: Apply stress for flowering after harvest		0.2	0	0	0
	50 days					

Irrigation & fertigation of young orchards

GENERAL GUIDELINES

- ✓ Recommendations are based on no rain.
- ✓ An effective rain event is one over 10mm.
- ✓ Rain efficiency should be calculated at 40% rate
- ✓ After a significant rain event you should resume irrigation when the topsoil layer starts drying. If the soil is sandy or when the climate is hot, it can be within 2-3 days. If the soil is heavy or during cooler periods it can be up to 7-8 days.

Coffee trees develop very quickly. Therefore, the amount of water and fertilizer should be raised according to tree size.

In the first year K_c will start with 0.3 and will grow according to tree size.

In the third year the trees should be irrigated like mature trees.



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