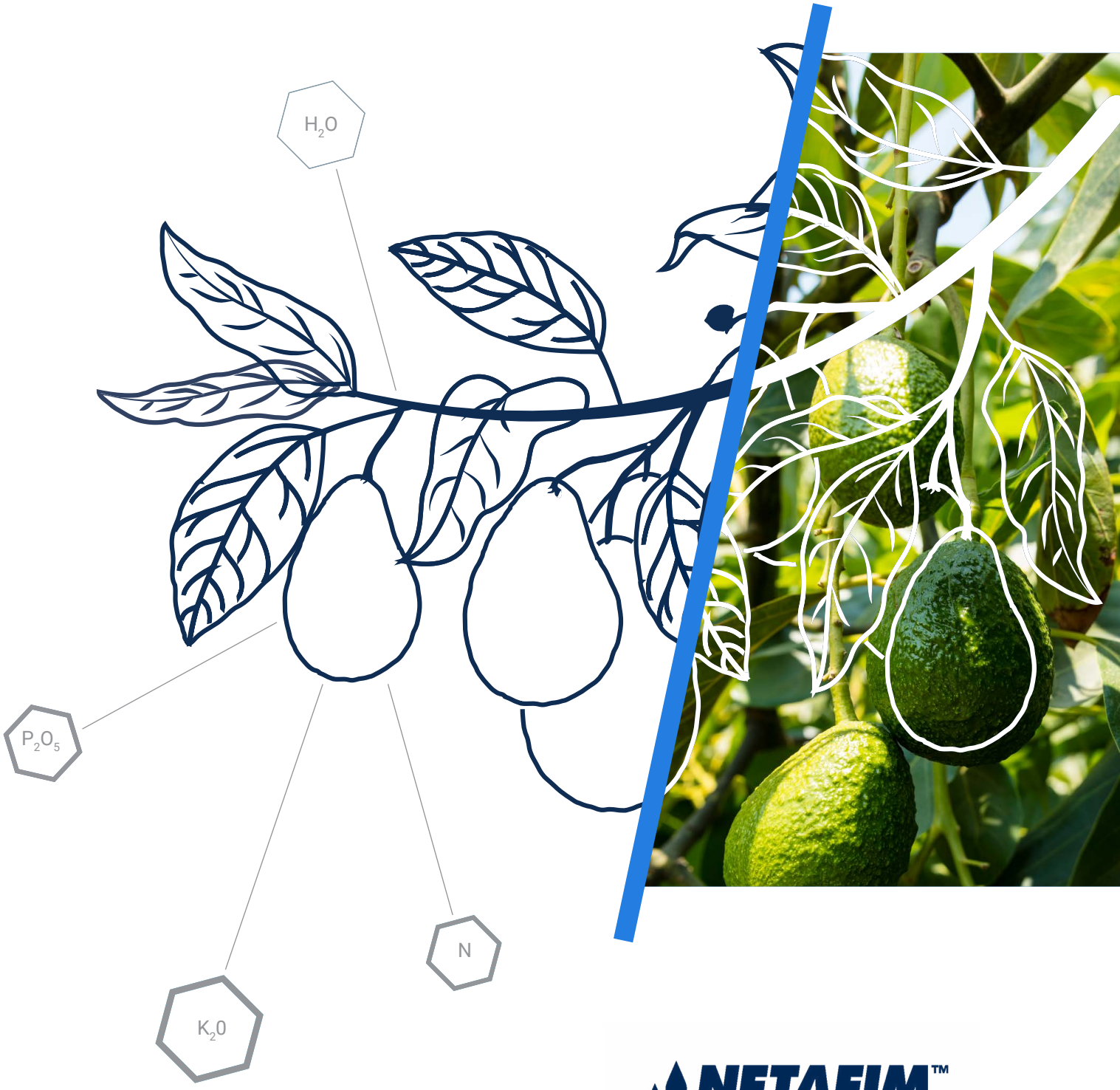
Avocado

Irrigation & Fertigation Guidelines



NETAFIM™

Irrigation & fertigation of productive orchards

GENERAL GUIDELINES

Following are basic guidelines for irrigation and fertigation of Hass Avocado orchards with estimated yield of 18ton/ha. It is recommended to adjust your plan based on your specific local conditions related to soil type, climate, rootstock, planting patterns and yield targets.

Irrigation principles:

- Avocado has a shallow root zone so frequent irrigation is important
- Recommendations are for drip irrigation. if using micro-sprinklers add 20% to the water dose
- 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 top soil layer starts drying. If soil is sandy or when climate is hot it can be within 2-3 days. If soil is heavy or in cooler periods it can be up to 7-8 days
- Recommendations are for fully grown trees, if trees are already productive but canopy is not fully grown, you can reduce 10-20% of the irrigation quantity according to tree size

- Convert mm/day or m^3/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: 5mm/day = 50m^3/ha/day
Dripper spacing : 0.5m
Lateral spacing : 4.5m (usually 2 laterals per crop row are used. So typical lateral spacing is 2.25m)
Dripper flow rate : 1.0 l/h

$$\frac{1.0}{0.5 \times 2.25} = 0.88\text{mm/hour} = 8.8\ m^3\text{/ha/hour}$$

$$\frac{5\text{mm/day}}{0.88\text{ mm/hour}} = 5.6\text{ hours per shift /day}$$

Fertigation principles:

- Fertilizing guidelines are based on the assumption that P and K levels in the soil are low-to-medium
- It is recommended to apply fertilizer in every irrigation so split the total amount for the relevant period in to 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
- In case of rain, skip irrigation but do not skip fertigation. Fertigate with a high concentration of fertilizer and a small water volume
- Avocado is sensitive to salinity. Do not irrigate with water that has EC levels above 1.5ds/m

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
	Floral bud break and inflorescence development	Flowering to fruit set	Fruitlet growth	Fruit growth	Fruit growth and flower differentiation	Harvest and flower differentiation
						
Kc	0.5	0.65	0.75	0.85	0.85	0.5
Irrigation interval light soil (days)	1	1	1	1	1	1
Irrigation interval heavy soil (days)	1	1	2	2	2	3
N (Kg/ha/stage)	25	20	45	45	65	50
P_2O_5 (Kg/ha/stage)	5	5	10	10	15	10
K_20 (Kg/ha/stage)	25	20	45	45	65	50
IRRIGATION EXAMPLE:						
Typical ETO	5	6	7	8	6	2.5
Daily irrigation (mm/day)	2.5	3.9	5.3	6.8	5.1	1.25
	30 days	**30** days	**60** days	**60** days	**90** days	**95** days

Irrigation & fertigation of young orchards

GENERAL GUIDELINES

- Recommendations are in liter per tree per day (L/T/D)
- Recommendations are based on mild climate such as Mediterranean temperatures.
- Recommendations refer to water that is applied close to the trunk within the reach of the young root zone – any water applied that doesn't meet the root zone shouldn't be considered
- Make sure there are drippers directly above the root zone and that drops do not slide along the drip lateral and miss their target
- Root zone diameter is roughly parallel to canopy diameter, so drippers that are not below the canopy do not serve the effective root zone
- During first years you can cap drippers between the trees to avoid water and fertilizer waste. Use the designated cap for UniRam and keep opening the caps as crop develops

  Example:

  In a first year orchard near the root zone there are 4 drippers of 1.0 l/h and the recommendation is of 10 L/T/D – irrigate for 2.5 hours per shift per day
- Recommendations are based on no rain
- 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 top soil layer starts drying. If soil is sandy or when climate is hot it can be within 2-3 days. If soil is heavy or in cooler periods it can be up to 7-8 days.

Year 1

		Cool					Hot					Cool	
	January	February	March	April	May	June	July	August	September	October	November	December	**Sum**
L/T/D	8	8	8	8	8	10	15	20	20	10	8	8	
N	5	4	6	6	6	6	7	7	6	6	6	5	**70**
P_2O_5	2	2	3	3	3	3	3	3	3	3	3	2	**30**
K_2O	5	4	6	6	6	6	7	7	6	6	6	5	**70**

Year 2

		Cool					Hot					Cool	
	January	February	March	April	May	June	July	August	September	October	November	December	**Sum**
L/T/D	10	10	10	10	15	15	20	25	25	20	10	10	
N	7	6	9	9	9	9	9	9	9	9	9	7	**100**
P_2O_5	2	2	3	3	3	3	3	3	3	3	3	3	**35**
K_2O	7	6	9	9	9	9	9	9	9	9	9	7	**100**

Year 3

		Cool					Hot					Cool	
	January	February	March	April	May	June	July	August	September	October	November	December	**Sum**
L/T/D	15	15	15	15	20	20	30	40	40	30	20	20	
N	7.8	7.1	10	11	11	11	11	11	11	11	10	8.7	**120**
P_2O_5	2.6	2.4	3.4	3.5	3.5	3.6	3.7	3.7	3.5	3.6	3.5	2.9	**40**
K_2O	7.8	7.1	10	11	11	11	11	11	11	11	10	8.7	**120**