

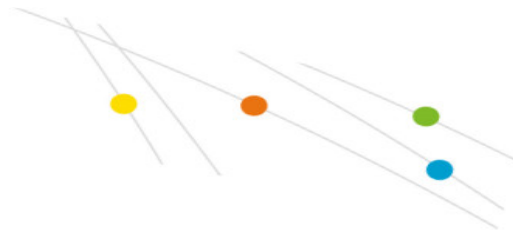
Improved culture of papaya in the west coast of Mexico with Ultrasol® Papaya

The Mexican state of Colima, ranks first nationally in exports of papaya (Carica papaya L). The fruit is an important export product: 40% of the production grown on approximately 2000 ha is sold abroad. Main markets are the United States of America and Canada. Papaya from Colima is also exported to markets in Europe and Asia; countries like Spain, France, Germany and Japan.

Table 1. Use of Ultrasol® Papaya in Mexican fertiliser program

Phenological Stage Etapas fenológica	Duration (weeks) Semanas	Fertilisers / Fertilizantes	kg/ha per week kg/ha por semana	Total kg/ ha	Nutrient application / Aporte de nutrientes (kg/ha)				
					N	P ₂ O ₅	K ₂ O	MgO	CaO
Bud Break / Brotación floral month/mes 1	4	Ultrasol® Papaya (20-10-15)	15	60	12	6	9	1	
		Ultrasol® Inicial (15-30-15)	40	160	24	48	24	3	
		Subtotal nutrients/ha; Subtotal Unidades Hectárea			36	54	33	4	0
		Nutrient ratio/ Relación Nutrientes			1,0	1,5	0,9		
Flowering / Floración month/mes 2	4	Ultrasol® Multipropósito (18-18-18)	28	112	20	20	20	2,5	
		Ultrasol® Magnit	10	40	5			6,5	
		Yara liva Calcinit	15	60	9				16
		Subtotal nutrients/ha; Subtotal Unidades Hectárea			34	20	20	9	16
		Nutrient ratio/ Relación Nutrientes			1,0	0,6	0,6		
Fruit Development/ Frutificación months/ mes 3-6	12	Ultrasol® Papaya (20-10-15)	40	480	96	48	72	10	
		Ultrasol® NKS	15	180	22		83		
		Ultrasol® Magnit	8	96	11			10	
		Yara liva Calcinit	10	120	18				32
		Subtotal nutrients/ha; Subtotal Unidades Hectárea			147	48	155	20	32
		Nutrient ratio/ Relación Nutrientes			1,0	0,3	1,1		
Fruit Ripening / Maduración months/ mes 7- 10	12	Ultrasol® Papaya (20-10-15)	24	288	58	29	43	6	
		Ultrasol® NKS	35	420	50		193		
		Ultrasol® Magnit	6	72	8			11	
		Yara liva Calcinit	10	120	18				32
		Subtotal nutrients/ha; Subtotal Unidades Hectárea			134	29	236	17	32
		Nutrient ratio/ Relación Nutrientes			1,0	0,2	1,8		
		Total nutrients/ha Total de unidades fertilizantes por hectárea			350	151	444	50	80

Growers like to see rapid development of the crop, with short, sturdy stems and early



and abundant production. This can be realised with a correct supply of nutrients, in combination with suitable climatic conditions and management practices. Ultrasol® Papaya together with potassium nitrate is recommended to assist Colima papaya growers in their use of balanced nutrition. SQM's agronomist Ing. Andrey Pinacho monitored the application of an SQM fertiliser programme by Mauricio Tamayo, a producer in the municipality of Armería, Colima. In the new programme fertilisers are applied daily (Monday-Saturday) in contrast to the traditional programme, where weekly applications were practiced. After the first month, the dose and fertiliser composition is adapted every two-three months, following the development of the crop (Table 1). The SQM programme contains nitrogen in the form of nitrate, and is free of chloride. Total nutrient application is 350 kg/ha N, 151 kg/ha P_2O_5 , 444 kg/ha K_2O , 50 kg of MgO, and 80 kg of CaO. This programme aims to meet crop needs at an expected yield of 120 MT/ha, taking into account nutrient uptake efficiencies.



Figure 1. Well developed compact stems, leaves and fruits in papaya after application of Ultrasol® Papaya and potassium nitrate in Armería Colima, Mexico.

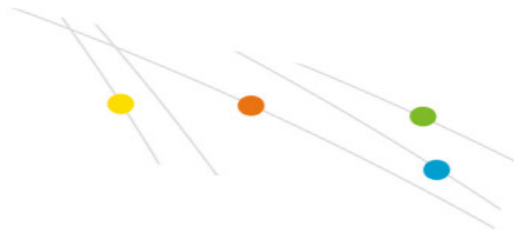


Figure 2. Larger fruits and more fruits set on papaya with applications of Ultrasol® Papaya and potassium nitrate compared to traditional practice in Armería Colima, Mexico.

With the aim of 120 MT/ha, the programme including Ultrasol® Papaya and Ultrasol® NKS is calculated to yield 20- 40 MT/ha more than would be expected from a traditional fertiliser programme. This is based on use of urea, DAP, triple superphosphate, KCl and magnesium sulphate: it does not contain nitrate sources, but does contain chloride. Papaya is susceptible to chloride, and excess can cause damage. On average growers using these fertilisers can achieve maximal yields ranging from 80-100 MT/ha, providing the soil and climate characteristics are optimal for crop development . In the fourth month of this programme practiced in the orchard in Armería, Colima, the stems stayed more compact with short internodes and fruit set started earlier than seen in previous years in this crop stage. The effect of controlled, but forceful growth is important: this promotes fruit set and prevents fruit drop that would lead to economic loss for the grower.

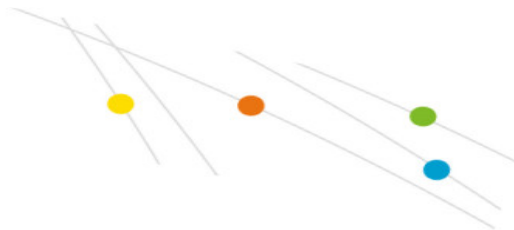
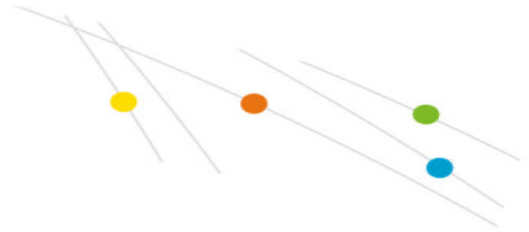


Figure 3. Left: Mauricio Tamayo, producer of papaya and right: Ing. Pinacho Andrey, agronomist in Armoría Colima, Mexico.

Of course, any fertilization plan must consider the micro nutrients beside the NPK and S, Mg and Ca. In Mexico, special attention is paid to boron: Boron deficiency in the early reproductive stages of the plant causes incomplete apical closure of the young fruit, allowing invasion of the internal cavity by pathogens and subsequent fruit drop. It is recommended to supply the boron needs by application of Ultrasol® micro Boro 1-2 kg / ha / week, beginning 15 days before the start of flowering till fruit set. Farmers and specialists from the region who have used the special formula Ultrasol® Papaya in this chloride-free programme based on potassium nitrate have recognized that the quality of the crop improved. Due to the optimized vegetative development during



shoot growth and improved setting and filling of the fruits, they have seen the production of papaya approaching the target yield of 120 tons of harvested fruit per hectare.