

Pineapple (*Ananas comosus* (L) Merr.)

French: Ananas; Spanish: Ananas, pina; Italian: Ananasso; German: Ananas

Crop data

Planted late summer/early autumn.

Flowers 17-18 months after planting (plant crop) and again 12-14 months later (ratoon crop).

Harvested 21-23 months after planting (plant crop) and again 12-15 months later (ratoon crop).

Forced flowering 12 months after planting advances maturity by 2 to 3 months.

Plant density: 40 000 to 45 000 plants per ha; 2-row bed.

Preferably grown on light to medium-textured soils, pH 4.5 to 6.5.

This crop requires good surface and internal drainage and tolerates drought, but benefits very much from mulching and irrigation.

Nutrient demand/uptake/removal

Yield t/ha	Source	Uptake or removal	kg/ha				
			N	P2O5	K2O	MgO	CaO
100	Cowie, 1951	uptake	123	34	308	-	-
81	Stewart et al, in Py, 1956	uptake	574	126	1 631	-	-
		removal	67	19	238	-	-
55	Martin-Prével, 1961	uptake	205	58	393	42	121
		removal	43	17	131	10	17

Plant analysis data

Plant analysis data - Macronutrients							
Variety & plant part	Stage of growth	Source	% of dry matter				
			N*	P	K	Mg	Ca
Smooth Cayenne; youngest mature leaf, white basal part	-	Samuels & Gandia-Diaz, 1960	1.6-1.9 (OS)	0.16-0.20 (OS)	1.8-2.5 (OS)	-	-
ditto	9 months old	Hernandez-Medina, 1969	-	-	-	0.20 (CVY)	-
ditto	Grand growth (summer)	Su, 1969	1.4 (CVY)	0.18-0.20 (AD)	3.4 (CVY)	0.28 (CVY)	-
	15 months old	ditto	1.75 (CVY)	-	-	-	-
Red Spanish; youngest mature leaf, white basal part	22 months old	Cibes & Samuels, 1958	-	-	-	0.25 (OS)	0.27 (OS)

ditto	-	Samuels & Gandia-Diaz, 1960	1.7-2.2 (OS)	0.20-0.25 (OS)	3.5-4.0 (OS)	-	-
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OS = Optimum supply; CVY = Critical value (yield); AD = Value observed where application was adequate.
 * Note that it is better to diagnose the nitrogen status on the basis of leaf colour; (optimum, intense green; excess, dark green; deficiency, pale or yellowish green) rather than leaf N analysis for which the critical value varies widely under different conditions and at different stages of growth.

Plant analysis data - Micronutrients						
Variety & Plant part	Stage of growth	Source	ppm dry matter			
			B	Mn	Zn	Cu
Smooth Cayenne; yougest mature leaf, white basal part	Lyman & Dean, 1942	-	-	16-44 (OS)	-	
Red Spanish ; Youngest mature leaf, white basal part	22 months old	Cibes & Samuels, 1958	14 (OS)	14 (OS)	-	-
ditto	ditto	Steyn, 1961	-	-	-	9-12 (OS)

OS = Optimum supply

Fertilizer recommendations

Organic manure or compost, where available, should be incorporated into the soil a week before planting. If the amount is small, it should be applied only around the plant row.

Liming is detrimental to pineapple except on extremely acid soils.

Mineral fertilizers:

Type of crop	Recommended rate of nutrients, kg/ha		
	N	P2O5	K2O
Plant crop (in 5-6 dressings)	500-650	0-180	300-600
Ratoon crop (in 3 dressings)	220-300	nil	100-200

Little potash is needed on soils with over 140 ppm exchangeable K.

Timing of fertilizer dressings:

On medium-textured soils or where plastic mulch is used:			
Timing	N	P2O5	K2O
Plant crop			
Before planting (early autumn)	25 %	100 %	40 %
Early spring (at 6 months)	10 % (in solution with insecticide)		
Early summer (at 9 months)	20 %		30 %
Early autumn (at 12 months)	15 %		10 %
Late autumn (at 14 months)	10 %		
Early spring (at 18 months)	20 %		20 %

Ratoon crop			
Late summer (after harvest of plant crop)	40 %		60 %
Mid-autumn	20 %		
Early spring	40 %		40 %

On light soils without plastic mulching:			
Timing	N	P2O5	K2O
Plant crop			
Within 1 months of planting	15 %	33 %	20 %
Early spring (at 6 months)	20 %	33 %	20 %
Early summer (at 9 months)	20 %	33 %	30 %
Early autumn (at 12 months)	15 %		10 %
Late autumn (at 14 months)	10 %		
Early spring (at 18 months)	20 %		20 %
Ratoon crop			
Late summer (after harvest of plant crop)	40 %		60 %
Mid-autumn	20 %		
Early spring	40 %		40 %

From 12 months after planting, all fertilizers are applied to the axils of old leaves where the morning dew collects.

Where plastic mulch is used, the "third" dressing may be incorporated in basal dressing, which should then be broadcast and cultivated in.

Preferred nutrient forms

Pineapples respond better in both yield and quality to ammonium and urea N than to nitrate N, and to potassium sulphate than to the chloride. On sandy soils urea is inferior to ammonium sulphate.

Other nutrients

Mg-containing fertilizer is required where soil exchangeable Mg is below 70 ppm, magnesium-containing fertilizer should be applied to 50 to 120 kg/ha MgO. The optimum MgO : K2O ratio reported to be 1.0:2.5.

Where **micronutrient** deficiency occurs:

For inter-fruitlet corking, 0.3 % borax spray, 2 or 3 times at later stage of grand growth.

For leaf yellowing due to iron deficiency, 2-3 % ferrous sulphate spray monthly or as required (preferably mixed with urea).

For "crook-neck" and yellow leaf spots, one or two applications of 1 % zinc sulphate spray. For "green die-back" Bordeaux mixture at a rate containing 7 to 11 kg/ha copper sulphate.

Current fertilizer practices

Taiwan

For expected yield of 55-65 t/ha (plant crop) and 45-55 t/ha ratoon crop on medium-textured soil without plastic mulch or flower-forcing:

Timing	Application rates kg/ha		
	N	P2O5	K2O
Plant crop			
Basal	150	120	180
At 6 months	60*		
At 9 months	120		135
At 12 months (applied to lower leaf axils from this time on)	90		45
At 14 months	60		
At 18 months	120		90
Ratoon crop			
Immediately after harvest plant crop	120		90
2 months later	60		
At initial flowering	120		60

* Poured onto the plants in solution with insecticide

With plastic mulch on bed, and flower-forcing treatment in early autumn (11-12 months after planting) :

Timing	Application rates kg/ha		
	N	P2O5	K2O
Plant crop			
Basal	180	100	200
At 1 month	60 (in solution)		
At 9 months	120		80
One week after flower-forcing treatment	120		40
After flowering	120		80

India

official recommendations in 5 states					
State	Plants/ha (spacing)	N	P2O5	K2O	FYM t/ha
		kg/ha (g/plant)			
Assam	44 000	530 (12)	90 (2)	530 (12)	15
Karnataka	(0.6 x 0.3 m)	350	130	440	30
Kerala	40 000	320	160	320	25
Tamil Nadu*	(0.6 x 0.3 m)	500	40	660	40-50
West bengal	40 000	400 (10)	200 (5)	400 (10)	20

* ZnSO₄ and FeSO₄ spary where required
Source : Tandon, 1987

In Assam FYM at last ploughing, all P and K and half of the N as band or line placement, the remaining half of the N as foliar spray (450 g urea in 10 l of water) in 6 applications. In other states N and K are applied in 2- equal splits.

Queensland Australia

For both plant and ratoon crops:

Timing	Application rates kg/ha		
	N	P2O5	K2O
Basal	-	50	450
At 2-monthly intervals thereafter	15-25 (as 10% urea spary*)		

* 15 kg/ha N for young plants, rising to 25 kg/ha N for fully grown plants.

Where leaf yellowing due to iron deficiency occurs, 3 % ferrous sulphate is included in the urea spray.

Where "crook-neck" occurs, 30 kg/ha each of zinc sulphate and copper sulphate are added to the basal fertilizer.

Further reading

SAMUELS, G. et al.: Fertilizers and pineapples. Fertil. Feed. St. J. 50, p. 162, Puerto Rico (1959)

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TEIWES, G.; GRUENEBERG, F.: Science and practice in the manuring of pineapples. Green Bulletin 3, Verlagsgesellschaft fuer Ackerbau mbH., Hannover, Germany (1963)

Author: N.R. Su, Council of Agriculture, Executive Yuan, Taipei, Taiwan