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# Precision Farming in mango



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**Polyembryonic root stock**

**High Density planting**

**Water use efficiency & Balance nutrition**

**Canopy Management**

**Flowering & Alternate Bearing Management**

**Rejuvenation of senile Orchard**

**Managing Disorders**

**Disease and Pest management**



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# Precision Farming in mango

## **Polyembryonic rootstock:**

- use of polyembryonic rootstock like Bapakai, ollur.
- Using epicotyls and softwood grafting and salt tolerant rootstock

## **High density planting:**

- Amrapali being a regular-bearer, high-density planting (1,600 plants/ha)

## **Water use efficiency:**

- Several factors, which determine the response of irrigation like soil type, season, region, stage of tree growth and varieties, should be taken into account while making irrigation schedules. judicious water use, drip irrigation is being used in mango growing.
- Young plants require 9-12 litres water/plant/day,
- 3-6 years old 30-35 litres water/plant/day
- 6-10 years old 50-60 litres water/plant/day
- 9-12 years old 80-90 litres water/plant/day
- Fully-grown trees require 120 litres of water/plant/day



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### **Balance Nutrition:**

- Critical limits of N, P, K, Ca, Mg, S, Fe, Mn, Zn and Cu have been worked out which are 23, 0.06, 0.54, 1.71, 0.9, 0.12 per cent and 171.0, 66, 25, 12 mg/g, respectively.
- Optimum levels of leaf N have been worked out in the range of 1.40 to 1.54 per cent for maximum production.
- Beneficial effect on growth, flowering, fruiting and fruit quality can be achieved with foliar sprays of Zn (2-4% ZnSO<sub>4</sub> + half quantity lime) in the orchards thriving on sandy soils

### **Alternate Bearing Management:**

- Alternate-bearing is a common phenomenon in majority of commercial mango cultivars,
- To manage this problem, efforts can be made to regulate vegetative growth and flowering
- Use regular bearing variety
- Soil application of paclobutrazol has give higher no hermaphrodite flower.

### **Rejuvenation of unproductive orchard:**

# Cont.



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- New shoots bear flowers and fruits 2-3 years after pruning.
- The yield continues to increase in succeeding years turning the unproductive trees into productive ones.

## **Managing disorders:**

### **1. Spongy Tissue:** mainly Alphonso cultivar

- Early picking and post harvest dipping of  $\text{CaCl}_2$  (1-2%)

### **2. Malformation:**

- Malformation is a very serious disorder of mango in subtropics and sometimes causing up to 90 per cent crop loss.
- Removal of affected shoots,
- Spraying of 200ppm NAA during fruit-bud differentiation.

### **3. Black Tip:**

- This disorder is mainly prevalent in the vicinity of brick kilns or areas having higher concentrations of industrial gasses like sulphur dioxide and carbon monoxide.
- Spraying of Borax (1 per cent) or caustic soda (0.8 per cent) can control this disorder



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# HDP in Amrapali on different planting systems

<u>Planting system</u>	<u>Trees/ha</u>
■ Square system	1600
■ Hedge row system	2670
■ <b>Double hedgerow system</b>	<b>3556</b>
■ Paired row planting	2133
■ Cluster planting	2844
■ Maximum yield per unit area was recorded from the <b>double hedge row planting system</b> , followed by cluster planting and hedge row system at Bhagalpur, Bihar	



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**Table 2. Flowering and yield parameters in 'Alphonso' mango as influenced by high density planting**

Treatment	Spacing	No. of trees/ha	Flowering (%)		No. of fruits/tree		Average. fruit yield (kg/tree)		Average. yield (t/ha)
			2008	2009	2008	2009	2008	2009	
T <sub>1</sub>	2.5 m x 10 m	400	31.80	30.83	32	52	8.3	13.1	4.280
T <sub>2</sub>	5 m x 5 m	400	27.52	29.83	45	89	11.2	22.5	6.400
T <sub>3</sub>	5 m x 7.5 m	266	16.50	15.83	39	74	9.7	18.4	3.737
T <sub>4</sub>	5 m x 10 m	200	07.83	08.33	43	71	10.2	18.0	2.820
T <sub>5</sub>	10 m x 10 m	100	15.80	15.00	31	48	8.0	12.3	1.12
	SEm±		2.21	2.57	1.1	1.4	0.42	0.79	0.19
	CD ( <i>P</i> =0.05)		6.72	7.60	3.4	4.1	1.3	2.5	0.67

***Dalvi et al. 2010***



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***STUDIES ON THE EFFECT OF TRICKLE IRRIGATION WITH  
BLACK PLASTIC MULCH ON THE YIELD PARAMETERS  
AND PHYSICO- CHEMICAL COMPOSITION OF MANGO  
(MANGIFERA INDICA L.)***

***Panigrahi et.al., 2011***





# Effect of irrigation levels on the yield parameter of Mango

Treatment	Water applied(cm)	Length of fruits (cm)	Width of fruits (cm)	No of fruits/plant	Fruit weight(g)	Yield(q/h)	Increase in yield (%)	WUE (Q/HA-CM)	Emission uniformity(%)
T 1	27.50	6.81	4.53	194.31	138.70	26.95	-	0.98	85.10
T 2	27.28	6.95	4.95	222.67	142.15	31.65	17.43	1.16	85.25
T 3	26.32	6.98	4.04	360.27	125.68	45.27	67.99	1.72	87.24
T 4	25.67	8.71	5.13	293.14	153.25	44.92	66.60	1.75	90.25
T 5	23.95	7.07	4.68	278.71	146.12	40.72	51.12	1.70	90.80
T 6	23.12	8.82	5.24	328.53	161.18	52.95	96.47	2.29	93.12
T 7	23.32	8.01	4.90	239.30	148.19	35.46	31.53	1.52	92.72
T 8	18.67	8.89	5.82	366.17	163.65	59.92	122.26	3.21	95.35
T 9	25.70	8.14	4.45	225.23	141.55	31.88	18.27	1.24	91.45
T 10	23.09	8.04	4.85	262.08	145.39	38.10	41.37	1.65	93.40

T1=Basin irrigation with v-volume of water(control)T2=Basin irrigation with v –volume of water+plastic mulch,T3=Drip irrigation with v-volume of water.T4=Drip irrigation with v-volume of water+plastic mulch,T5=Drip irrigation with 0.8 volume of water,T6=Drip irrigation with 0.8 volume of water.+plastic mulchT7=Drip irrigation with 0.6 v-volume of waterT8=Drip irrigation with 0.6 v-volume of water+plastic mulch.T9 Drip irrigation with 0.4 v-volume of water,T10=Drip irrigation with 0.4v-volume of water +plastic mulch,



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# Effect of irrigation levels on physico-chemical composition of fruits

Treatment	Pulp(%)	TSS(%)	Moisture (%)	Peel(%)	Stone(%)	Acidity(%)	Weed control (%)
T 1	62.45	17.50	75.62	19.25	20.32	0.268	13.67
T 2	65.9	19.50	77.90	14.68	19.31	0.210	54.35
T 3	65.98	18.50	77.68	12.98	19.04	0.230	34.56
T 4	70.33	20.25	78.53	14.08	19.00	0.209	65.39
T 5	66.24	19.98	77.10	14.70	19.10	0.228	29.62
T 6	71.58	22.65	80.06	13.10	15.32	0.190	85.98
T 7	67.95	21.05	79.60	13.02	17.06	0.223	32.10
<b>T 8</b>	<b>72.20</b>	<b>23.25</b>	<b>80.71</b>	<b>12.95</b>	<b>14.38</b>	<b>0.178</b>	<b>90.20</b>
T 9	64.00	18.98	78.10	15.68	15.50	0.216	30.73
T 10	61.72	20.98	79.10	15.58	15.54	0.226	68.32



**THANKS**