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NAME OF CROP	CLIMATE & SOIL	VARIETIES	PROPAGATION METHODS	METHOD OF PLANTING
C.N. – Mango S.N. – Mangifera indica F – Anacardiaceae Origin – Indo Burma region.	→ Tropical and Sub-Tropical. → Opt. temp. = 24-27°C → Rainfall = 25-250 cm. → Soil - deep alluvial, red laterite soil. → pH of soil = 5.5 – 7.5	EARLY – Bombay green, Yellow Singapore, Alphonso, Banganpalli, Pairi MID – Langra, Dashehri, Krishnabhog, Gulabkhas. LATE – Chausa, Neelum, Amrapali, Kanchan, Sindhu, Ratna, Alphonso.	→ Inarching → Veneer / side grafting → Epicotyl / Stone grafting	→ Square, Rectangular, Hexagonal. → Size of pits – 1 × 1 × 1 mts → Planting distance – 10 × 10 mts
C.N. – Cashewnut S.N. – Anacardium occidentale F – Anacardiaceae O – South America (Brazil)	→ Tropical, sunloving → Temp. – not less than 20°C for prolong period. → Fruit drop - above 45°C → Rainfall - 600 mm/yr. → Soil – Best red sandy loam laterite soil & coastal sand. → pH - not more than 8.	Vengurla - 1, Vengurla - 2, Vengurla - 5 (Ensure early × Mysore kotekar), ULLAL - 1, ULLAL - 2	→ Air layering. → Fresh seed → Soft wood grafting. → Epicotyl grafting. → Commercial propagation by soft wood grafting.	→ M.O.P - Rectangular → S.O.P - 0.75 × 0.75 × 0.75 mts → P.D. – 7.5 × 7.5 or 8 × 8 mts → For closer spacing 4 × 4 mts.
C.N. – Guava S.N. – Psidium guajava F – Myrtaceae O – Tropical At America	→ Tropical, Sub-tropical, Temperate. → 23 - 28 °C, Best quality – low night temp (10°C) prev winter. → Rainfall = 1000-2000 mm/yr. → Soil – Best – river basin range – light sandy loam to clay, pH = 4.5 – 8.2	Sardar guava (Lucknow) 49, Allahabad Safeda, Red Fleshed guava (Hafsi), Chittidar, Safed jam, Kohir Safeda, Seedless guava (Saharangpur & Nagpur).	→ Seed → Air layering → Pot layering, Stooling, budding, cutting, grafting.	→ Square. → Size of pit – 0.75 × 0.75 × 0.75 m → Planting distance – 4 × 6 or 3.5 × 5 m

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FERTILIZER & MANURES	IRRIGATION	TIME OF PLANTING	MAIN PROBLEMS & ITS CONTROL
→ 40-60 kg FYM / hac. → Boron deficiency – Borax 0.5 % after fruit set. → NPK – 73 : 18 : 68 gm/yr. in two splits – (i) June-July (ii) Oct. → Before flowering – NH_4COOH_2 → Zn deficiency – $ZnSO_4$ 0.3 % Feb-March & May – after harvest org. manures & phosphatic ferti. → Mn deficiency – $MnSO_4$ 0.5 % after blooming.	→ Depends on age, soil and climate. → Upto 2 yr. old plant regular irrigation. → New grafted plant – 30 Lit. water/week. → After fruit set irrigate at 10 days interval.	→ Rainy season. (June – Aug) → **Time of Flowering** Normally Nov – Dec In C.G. – Dec – Jan → **Harvesting / Fruiting** Time – May – June **Yield** – 8-9 tonne per Ha.	– **Physiological disorders** – Alternate bearing (Soil trenching with Paclobutrazol 5-10 g / tree. → Mango malformation (200 ppm NAA). → Fruit drop – (2,4-D → 5-10 ppm) → Black tip / Necrosis (Borax 0.6 % / 0.8 % caustic soda at 10-14 days interval). → Spongy tissue (Mulching & sod culture). – **Diseases** – Anthracnose (Bordeaux mixture). → Powdery mildew (Sulfur fungicide) → Die back → Leaf Spot – **Insect / pest** – Mango hopper (Phosphamidon). → Mealy bug (Phosphamidon), → Stem borer (Petrol + Kerosene) → Bark eating caterpillar, → Fruit fly
→ 10-15 kg FYM → NPK = 500 : 125 : 125 g/plant/yr. in 2 splits (i) Premonsoon (May-June) (ii) Postmonsoon (Sept-Oct) → Ideal period – immediately after heavy rainfall. → Fert. applied on circular trench 0.5 m along with drip zone; Mulching ↑ Fert. efficiency.	→ Summer – at Fortnightly interval @ 200 Lit water/plant. → Irri. necessary in rainfed condition.	**T.O.P** – July – Aug. **T.O.F** – In Bastar – Feb. Mar – Apr. In South – Nov – Jan. **H/FT** – March – April **Yield** – V-1 (23 kg/tr) V-2 (15 kg/tr); ULLA-7 (18 kg/tr); ULLA-2 (15 kg/tr) V-5 (21 kg/tr.)	– **Disease** – Inflorescence blight Endosulfan (0.05 % spray) → Dieback / Pink necrosis (Pruning, Bordeaux spray 1 %) → Anthracnose (Bordeaux 1 %, Bevastin) – **Insect/Pest** – Tea mosquito (Carbaryl 0.05 %; phosphomedon 0.03 %, Quinalphos 0.05 %) → Stem & root borer (exposing roots 2 % carbaryl) and 1:2 mix. of coal tar + Kerosene premonsoon and post monsoon. → Leaf miner (same as tea mosquito).
→ In East – 260 : 320 : 260 NPK in 2 splits (i) Jan (ii) Aug → In West – 600 : 300 : 300 g/pt/yr NPK → South – 900 : 600 : 600 g NPK/pt. → North – 600 : 400 : NPK/pt/yr.	→ 8-10 irri. in a year. → Bearing tree require irri. during Apr/June at 15 days interval.	→ Rainy season. – **T.O.F** – Mrig bahar – June-July Ambe bahar – Feb-Mar. Hast bahar – Oct. **Harvesting / Fruiting** M.B. – Dec-Jan, A.B – June / July, H.B – Feb / March.	– **Diseases** – Wilt (Soil drenching with carbendazim or liming pits) → Anthracnose (Carbendazim, Triophanate methyl / g/Lit in June to Sep.) – **Insects / pest** – Bark eating caterpillar → Fruit fly (Sex pheromone trap, Malathion 0.1 % spray in 1 ml / Lit water). → Mealy bug → Scale insect.

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CROP NAME	CLIMATE & SOIL	VARIETIES	PROPAGATION METHODS	PLANTING METHOD
C.N.- Coconut S.N. - Cocos nucifera F - Palmaceae Ori. - South East Asia	→ Well distributed rainfall 800-2500 mm per yr. Withstand water logging annual temp. of 27°C with diurnal variations of 5-7°C ; cold injuries below 15°C, opt pH = 80-90% not below 50%. → Soil - Laterite, red lateritic sandy, Alluvial sandy, alluvial coastal, Black soils, pH = 5.5 - 6.8.	Anandaganga, Chandrakalpa, Chandralaksha, Kerasankara, Chandrasankar, Lakshaganga, Pratap, VHC-12, Philippines ordinary.	→ Only through seedling.	→ 0.9 x 0.9 x 0.9 mt → 2.7 x 2.7 mts
C.N.- Coffee S.N. - Coffea arabica F.- Rubiaceae	→ Tropical rain forests, needs well distributed rainfall & good shade of evergreen trees. → Soil - Deep, friable, rich in slightly acidic. pH = 6-6.5	Arabica → Arusha, Bourbon, Catimor, Selection 9	→ Seeds → Root cutting → Wedge / cleft grafting	→ Square or triangular hedge system. → 1 x 1 x 1 mts → Sq. → 7.5 - 9 mt triangular - 9 mts
C.N. - Litchi S.N. - Litchi chinensis F - Sapindaceae Ori. - Southern China	→ Sub tropical, frost free, moist atm., abundant rainfall, ideal 30°C for growth, dry hot winds in summer - fruit cracks. → Soil - variety of soil, deep well drained loam rich in organic matter, pH = 5.5-7.	→ Mujaffarpur, Seedless Saharanpur, Shahi purbi, Dehradun, Rose scented, Calcutta, China, Ilaichi, Bombay.	Layering, Cutting, Budding, Grafting, Stooling.	S.O.P - 1 x 1 x 1 mt. P.D. - 8 - 10 mts.
C.N. - Banana S.N. - Musa Paradisica F - Musaceae Ori. - South East Asia	→ Tropical (warm - humid) → Temp. for growth - ~~40~~ 10-40°C Opt. Temp. = 20-30°C → Rainfall - 50 - 2000 cm/yr. → Soil - Sandy loam, well drained. pH = 6.5 - 7.5	Dwarf Cavandish, Poovan (Champa), Basrai dwarf, Rasthali, Robusta, Bhusawal, Kabuli, Mauritiles, Harichal, Amritpant, Malbhig, Nendran, Kanchkol	Suckers & Rhizomes Corms	P.M. - Square, Rectangular. S.O.P. - 0.6 x 0.6 x 0.6 mts P.D. - Tall varieties 2.5 x 3 or 2^{x3}_{x} mts dwarf varieties 2 x 1.8 or 1.8 x 1.8 m

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MANURE & FERTILIZER	IRRIGATION	TIME OF PLANTING	MAIN PROBLEMS
Year | May-June (N P K) | Sept-Oct (N P K) 1st yr. – – – | 50 40 135 2nd yr. 50 40 35 | 110 80 270 3rd yr. 110 80 270 | 220 160 540 4th yr. 190 120 400 | 320 200 800	→ Avoid moisture stress condition. Summer - 200 L water once in 4 days in basin of 1.8 mt. In drip - 30-40 L water/day.	**T.O.P.** – May-June or Oct-Nov. **Yield** – Arerage 44 nuts/palm/year Hybrid – 100-140 nuts/palm/year	**Diseases** – Root wilt, Leaf spot, bud rot, Basal stem rot, Stem bleeding, Fruit rot, Grey leaf spot. **Insect/pest** – Rhinoceros beetle, Red palm weevil, White grub, Mealy bug, Scale insect, Defoliating caterpillars, Nut borers, Termites, Mites.
→ Liming NPK – 12 : 90 : 120 g/plant/year → foliar spray – 1% urea / 2% DAP, 1% SSP, 0.1 % MOP, 0.25 % $ZnSO_4$	→ 2.5 cm water at 15 days interval during dry months. Irrigation for blossom: 2.5-3.25 cm during 2nd fortnight Feb and 2nd week of March followed by 2.5 cm backing 15-20 days after flowering. Irrigation for mature coffee: 2.5-3.25 cm irri. 15-20 days interval.	**T.O.P** – Monsoon-July-Sept. **F/H** – Nov-Jan **Yield** – Unirrigated :- 1000-12000 kg/Hac. Irrigated condition:- 2000-5000 kg/ha.	**Diseases** – Leaf rust, Black rot, Brown rust, Red root, Black root, Anthracnose, Berry blotch, Brown eye spot, Collar rot / damping off. **Insect/Pest** – White stem borer, Coffee berry borer, Shoot hole borer, Mealy bug, Green scale root lesion nematode, Red borers, Snail, Hairy caterpillar, Termites, Thrips.
	Young trees by basin sys., full grown trees flooding & furrow, weekly irrigation in summer.	**TOP** – Aug-Sept. **ToF** – Jan-Feb. **F/H** – May-June **Yield** – 80-150 kg/tree	→ Sunburn, Skin crack (NAA, GA, 2,4-D) → Fruit borer, fruit fly, Mite, Bark eating cator
→ 20 kg FYM → NPK = 300 : 250 : 100 5 splits at 16 days interval for tissue culture & in C.G. → For Tamil Nadu Agri. University NPK - 200 : 150 : 250 gm	→ Needs regular irrigation. → In summer - 3-5 days interval → In winter - 7 days interval.	**T.O.P** – After monsoon. (June-July) **T.O.F** – 6 months after planting. **H/FT** – 12 months after planting. **Yield** – Dwarf cavandish- 25 kg/bunch, Robusta - 30 kg/bunch Rasthali - 15-20 kg/bunch	**Disease** – Leaf spot (Carbendazim/Thiophenate methyl → Panama Wilt (dip suckers in Carbendazim 1 kg/L) → Anthracnose (Carbendazim Bevastin 2g/L) → Bunchy top (Endrin 0.2% / Diazinon 0.03%) **Insect/Pest** – Aphid (Methyl demeton @ 0.5-0.8 ml per plant at 3-4 week interval) → Banana weevil → Banana beetle → Stem borer

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NAME OF CROP	CLIMATE & SOIL	VARIETIES	PROPAGATION METHOD	PLANTING METHOD
C.N. – Papaya S.N. – Carica papaya F. – Caricaceae Ori. – America	→ Tropical (hot & humid climate) → In winter if Temp. below 12-14°C for several hours – growth severely affected. → High rainfall – injurious → Susceptible to water logging & frost. → Opt. Temp. – 50-100°F / 22-25°C → Soil :- Rich well drained sandy loam alluvial, pH = 6.5 – 7.5 avoid heavy clay soil. → Rainfall = 1500 – 1800 mm/years	Honey dew, Coorg honey dew, Co-1, Co-2, Co-3, Co-4, Co-7, Washington. Pusa delicious, Pusa majesty, Pusa giant, Pusa dwarf, Taiwan hybrid, Red Lady	→ Seed → Tissue culture or micro-propagation	P.M. – Square S.O.P – 0.5 × 0.5 × 0.5 mt P.D. – 2 × 2 m in general 4 for dwarf 1×1 or 1.5×1 m
C.N. – Apple S.N. – Malus pumila F – Rosaceae Ori. – South West Asia	→ 1000 – 1500 hrs. of chilling below 7°C during winter. → Temp. – 21 – 24°C → Rainfall = 100 – 125 cm → Soil :- Loamy soil rich in organic matter. pH = 5.5 – 6.5	Royal delicious, Jonathan, Rome beauty, Ambri, Sunheri, Ambrich, Lal ambri	→ Budding → Grafting (tongue / cleft)	M.O.P – Square or Hex. slope – contour. S.O.P – 1×1×1 m P.D. – 4×4 m for dwarf For bearing – 7×7 m
C.N. – Strawberry S.N. – Fragaria vesca, Fragaria ananassa. F. – Rosaceae	→ Temperate ; Growth – low temp. & for flowering & fruiting medium temp. & short day. → Soil – Well drained. pH = 5.7 – 6.5 → excess pH – retarding of root growth.	Pusa early dwarf,	→ Division → Runners	P.D. – Row to row 90 cm P–P = 25 cm
C.N. – Lime or Lemon S.N. – Citrus sp. F – Rutaceae Ori. – East Asia.	→ Acid lime – All parts except frost susceptible, major centres are drier region. → Areas suited – Warm, moderate humid, free from strong winds & frost. R.F. – 750 mm/yr. R.F above 1250 mm citrus canker, powdery mildew. → Sweet lime – Hardy. withstand frost lemons – wide adaptability, humid & semi-humid, areas high RF more tolerant to frost. → Soil – Black light, 100 mg – uniform texture, well drained, organic matter, sensitive to water logging, pH = 6.5 – 7	Acid Lime – Pramalini, Vikram, Chakradhar, Tahitilime (Persian) Sweet lime – Mithachikra, Mithatra. Lemon – Eureka, Lisbon, Lucknow-Seedless, Nepali round.	→ Seed & air layering (lemon) by seed (lime) by T. bud & shield budding (sweet orange)	S.O.P. 0.75 × 0.75 × 0.75 m P.D. – 5 mts

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FERTILIZER & MANURE	IRRIGATION	TIME OF PLANTING	MAIN PROBLEMS
→ FYM – 40 kg → NPK = 250 : 250 : 500 g/plant / years at 60 days interval in 6 splits.	→ Needs regular irrigation → In Summer irigate in 3-5 days interval. → In winter irrigate in 5-6 days interval.	→ T.O.P – Rainy or spring season. T.O.F – Rainy season. H/FT – April - July Yield – 50 - 100 kg Fruits / tree or 60 - 75 tonnes / ha.	Diseases – Powdery mildew (wettable sulphur 1 g/L). → Damping off (seed treat. Captan, Thiram @ 2 g/kg) → Anthracnose – (Carbendazim, thiophanate methyl 115 days before harvesting) → Stem rot Insect / Pest – Aphid (Dimethoate 0.3% or methyl Dimeton 0.05 %) → Stem borer → Mites → White fly → Thrips
→ 1st - 3rd yr. – 10-20 kg FYM NPK → 100-200 : 30-90 : 65 - 200 g → 4th - 5th yr. – 30-40 kg FYM NPK → 300 - 350 : 120 - 150 : 250 - 300 → 6th yr. above – 50 kg FYM NPK → 400 : 200 : 350 kg	Proper irrigation at the time of fruit & flowering	T.O.P – Early spring Yield – 30 - 50 kg fruits / tree	Disease – ① Stem black disease (spray Dithan M-45 @ 2%) ② Pink disease ③ Powdery mildew (spray Bordeaux mix) ④ Apple scab (Dithan M-45 (Mancozeb) at 0.5% or Bavistin (Carbendazim) at 0.05 %) Insect / Pest – ① Woolly aphids (Spray Dimethoate or phosphamidon 0.03 % during March - April & June) ② Hairy catterpillar – (Dimethoate 0.03 %) ③ Blossom Thrips – (Spray Phospalone 0.035 % or Fenitrothion 0.05 %) ④ San Jose scale
270 - 375 g/ha - FYM N = 75 - 100 kg / ha P_2O_5 = 80 - 120 kg / ha K_2O = 50 - 80 kg / ha.	→ Winter irrigation 10 days interval → Summer irrigation 4-5 days interval	T.O.P – Oct	
→ 1st - 3rd yr. – 10-30 kg FYM NPK → 100-200 : 50 - 200 : 150 - 300 g → 4th - 6th yr → 40 - 60 kg FYM NPK → 400 - 600 : 300 - 400 : 600 g → 6th or above → 100 kg FYM NPK → 800 : 500 : 800	→ Winter → 12 - 15 days interval → Summer → 8 - 10 days interval	MOP – Rainy or Spring F/HT – Nov - Jan or July - Aug Yield – 150 - 200 fruits per plant	→ Fruit drop → Citrus canker → Lemon butterfly

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NAME OF CROP	CLIMATE & SOIL	VARIETIES	PROPAGATION METHOD	METHOD OF PLANTING
C.N.- Grapes S.N.- Vitis venefera F- Vitaceae Ori- Armenia	→ Subtropical fruit ; ideal hot & dry climate → Summer - mild temp. not exceeding 35°C. In high humidity vegetative growth is more. → Soil :- variety of soil, deep loamy, well drained, pH = 6.5 - 7.5	Pusa seedless, Beauty seedless, Thompson seedless, Kandhari, Perlette, Muscat, Banglore blue, Anab-e-shahi, Shyam, Arka kanchan, Arka Hans, Arka - Shweta	Stem cutting	MOP - Square SOP - 1 mt wide 75 cm deep or ½ × ½ × ½ m PD - 2 × 2 m for bower -
C.N.- Aonla S.N.- Emblica officinalis F- Euphorbiaceae Ori. - South-East Asia	→ Sub-tropical, heavy frost harmful, Aonla tree tolerates freezing temp. → Initiation of floral bud, initiation of fruit growth Warm temp. humidity ; heavy dropping & delay in fruit growth - dryspells → Soil :- variable soil condition, slightly acidic to saline / sodic, pH = 6.5 - 9.5 Heavy soil not suitable	Banarsi, Francis, (Susceptible for fruit necrosis) Chakaiya, NA-4 (Kanchan), NA-6, NA-1	→ Seed → Patch / ring budding → Grafting	MOP - Square SOP - (Size of pits) 1 - 1.25 m PD - Planting distance = 10 × 10 m
C.N.- Ber S.N.- Zizyphus mauritiana F- Rhamnaceae Ori- Indo-China region	→ Tropical, dryness for development of good fruits → High atm. humidity - disadvantageous → Soil :- Sandy, clayey, saline, alkaline suitable.	Gola, Seb, Banarasi, Karaka, Imran, Mehanim, Mundia, Kaithali, Jogia, Banarsi muna.	→ Seed ring commercial propagation → Budding T. Budding	MOP - Rectangular or Square SOP - 0.6 × 0.6 × 0.6 m PD - Low rainfall - 6 × 6 m For irrigated - 8 × 8 m
C.N.- Pineapple S.N.- Ananas comosus F- Bromeliaceae Ori- Brazil	→ Humid tropical ; Opt. temp - 22 - 32°C, leaves & roots grow well in 32°C & 29°C respectively. → Growth ceases below 20°C & above 39°C. difference of at least 4°C b/w day & night - desirable, Frost free climate. → Soil :- all type except very heavy clay best - sandy loam, pH = 5 - 6 avoid water logging.	Kew, Giant Kew, Charlotte Rothchild, Mauritious, Lakhat, Queen, Jaldhoop	→ Suckers or Crown, slip	Flat bed, furrow contour, trench SOP - PD - P-P = 35 - 40 cm R-R = 75 - 90 cm

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MANURE & FERTILIZER	IRRIGATION	TIME OF PLANTING	MAIN PROBLEMS & ITS CONTROL
→ 1st yr. → 200 g N → 2nd yr. → 20 kg FYM N:P = 300 : 160 → 3rd yr. → 40 kg FYM NPK = 400 : 240 : 300 g	→ Light frequent irrigation regular irrigation upto 7 year. → Summer – 1 week interval Mar - April - 2 weeks Winter – 1 month	**TOP** – Oct. (unrooted cuttings) Jan-Feb - rooted cuttings **F/HT** – May - Sept **Yield** – 6 - 10	**Physiological disorder** – Uneven ripening, Post harvest berry drop, flower drop, Pink berry **Disease** – Downey mildew, Powdery mildew, Anthracnose, Rust, Bacterial canker. **Insect/Pest** – Defoliating beetles, Leaf roller, Yellow & red wasp, Flat headed borer.
→ FYM – 10 kg, NPK = 100 : 50 : 100 g/plant/yr. → For 1 yr. old plant. → Dose increase upto 10 yrs. → Full 'P' & ½ 'N' & 'K' during Jan-Feb remaining in Aug.	→ Summer – 15 - 20 days interval, No irrigation in rainy & winter, avoid brackish water. → For bearing plantation 1st irri. after manuring No irri. during flowering → Salt affected area – 10 - 25 days interval.	**TOP** – Rainy season (July - Aug) or Feb. **TOF** – March – April **F/HT** – Nov – Dec. **Yield** – 1 - 3 Q/tree 15 - 20 ton/ha.	→ Rust (wettable sulphur) → Shoot gall maker (Carbo. 1%) → Bark eating caterpillar → Fruit borer → Aphid (dimethoate 0.03%)
→ Normally – NPK = 250 : 250 : 0 g/pt → 750 g N gives highest yield	→ Irri. in Nov - Feb 3-4 weeks interval, Oct irri. causes flower shedding. → Irri. in March - April caused fruit spoilage & delays ripening. → 0.1% Power oil & 7.5 Kaolin conserve water.	**TOP** – Rainy season **TOF** – Mar – Dec **F/HT** – Feb - Mar. **Yield** – 80 – 200 kg per tree	→ Powdery mildew (wettable sulfur, Kerathen) → Leaf spot - Rust - Black spot → White fly (dimethoate) → Fruit borer - (ERV - Gola, Kurgaon, Kadala) → Leaf eating caterpillar - (Carbaryl) → Mealy bug - Thrips
→ N & K_2O @ 12g/pt & if soil is poor 'P' then P_2O_5 @ 4g/pt → N applied in 6 splits K in 2 splits	→ Supplementary irri. – good sized fruits → In scanty Rainfall – irri. 20 - 25 days interval	→ Differ from region **TOP** – Rainy or winter **TOF** – Dec – March **F/HT** – May – Aug	→ Mealy bug → Fruit eating caterpillar → Termites

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NAME OF CROP	CLIMATE & SOIL	VARIETIES	PROPAGATION METHOD	METHOD OF PLANTING
C.N. – Pomegranate S.N. – Punica granatum F – Punicaceae Ori. – Iran (Persia)	→ Subtropical, semi arid, hot dry summer, cold winter with proper irrigation; Hot dry climate ripening; Tolerate drought when dormant; injured below → −11°C Soil – Wide range, well drained, sandy loam to deep loam or alluvial, cultivated also in light soil tolerant to salinity to some extent.	Alandi, Paper shell, Dholka, Khandhari, Kabul, Muskati red, Spanish ruby, Ganesh, Jodhpur, Jyoti, Mridula.	→ Cutting → Air layering → Root suckers	MOP – Square SOP – 0.6 × 0.6 × 0.6 m PD – 4.5 to 4.5 m
C.N. – Jack fruit S.N. – Artocarpus heterophyllus F – Moraceae Ori. – India	→ Warm humid climate → In S. India needs arid & warmer climate → It cannot tolerate cold & frost.	Gulabi, Champa, Hazari (local selections), Singapore or Ceylon Jack, Varikka, Koozha, Rudraksh	→ Seeds → Air layering → Inarching → Epicotyl forkent → Chip, Patch	MOP – Square or hexagon (if less fertile) SOP – 1 × 1 × 1 m PD – 10 × 10 or 12 × 12 m
C.N. – Custard apple S.N. – Annona squamosa F – Annonaceae Ori. – Tropical America	→ Hot & humid climate → Soil – deep loamy. → Rainfall – 50–75 cm	Lal sitaphal, British Guinea, Balanagar, Barbados seedling, Mammoth	Soft wood grafting.	SOP – 0.6 × 0.6 × 0.6 m PD – 5 × 5 m

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MANURE & FERTILIZER	IRRIGATION	TIME OF PLANTING	MAIN PROBLEM
→ 5 yr. old – 10 kg FYM, 75 g – Amm. sulphate → Normally – 50 kg FYM 3.5 kg oil cake; 1 kg Amm. sulphate (prior to flowering) NPK → 600–700 : 200–250 : 200–250	Mrigbahar – Mid May Regular irrigation upto monsoon. In summer weekly & winter bi-weekly irrigation. → Check basin preferred.	TOP – Feb – March TOF – Nov – Dec & Feb – March Yield – 60–80 fruit/plant	Disease – Fruit cracking, internal breakdown, Leaf spot (Mancozeb), Fruit rot. Insect/Pest – Aphid, Bark eating catterpillar, Mites, Fruit sucking moth, White fly, Mealy bug.
→ 80 kg FYM/tree → 1–3 yr. → 200 : 120 : 60 g NPK → 4–7 yr. → 400 : 240 : 120 g → 7 yr. – 600 : 300 : 240 g	→ It is normally not irrigated. → The tree is sensitive to drought. → Irrigation during dry period is essential in arid regions for normal growth.	TOP – Rainy (June–Aug) TOF – Jan – Feb FT/H – May – Sept. Yield – 250 fruits/tree/yr. or 40–50 tonnes/ha.	Disease – Pink disease (Cu. oxy. chl.) → Leaf spot Insect/Pest – Shoot & fruit borer – Bud/leaf eating weevil – Aphid – Giant mealy bug.
→ For 1–2 yrs. – 25 kg FYM, NPK – 75 : 50 : 50 g/pt/yr. → For 3–5 yrs. – 25–50 kg FYM, NPK – 150 : 100 : 100 g/pt/yr. → Above 5 yrs. – 50 kg FYM, NPK – 250 : 125 : 125 g/pt/yr. → Green manuring – Green gram & Sunhemp.	For best results & luxuriant growth regular irrigation. Without irrigation can also survive.	TOP – Spring F/HT – Jan – Feb or Dec – Jan Yield – 50–75 fruits/plant	→ Mealy bug (dip suckers – Fenitro 0.05%) → Fruit eating catterpillar → Termites (drench with chloropyriphos 0.1%)

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NAME OF CROP	CLIMATE & SOIL	VARIETIES	PROPAGATION METHODS	METHOD OF PLANTING
C.N. – Peach S.N. – Prunus persica F – Rosaceae Origin – China	→ Require humid climate with cold winter & dry summer. → Temperate fruit. → Swelling buds are injured at −6.5°C → Chilling requirement – 850 hrs. → Sites free from early spring frost is suitable. → Land with gentle slope – ideal. → Soil :– Deep sandy loam rich in organic matter, perfect drainage. – Susceptible for water logging – Fertile & heavy soils are hazardous. – pH = 5.8 – 6.8	Table :– Alexander, Elberta, J.H. Hale, Cardinal. Canning :– Fortuna, Golden bush, Halford. Nectarine :– Nectared, Sunlite, Sunrise.	→ Commercially – Grafting & Budding. – Tongue or cleft grafting. – T budding or ring budding → Rootstocks – generally peach seedlings though plum, apricot & almond can be used.	→ Hilly areas – Contours or terracing system. → Plain – Square → Size of pits – 1 × 1 × 1 m → Spacing – 6–7 m in hills. 3 × 3 m in HDP.
C.N. – Pear S.N. – Pyrus communis (French / European) Pyrus pyrifolia (Japanese) F – Rosaceae Ori. – South-West Asia	→ Temperate → Tolerate as low as −26°C & as high as 45°C. → Chilling requirements – below 7°C for 1200 hrs. during winter. → Soil :– Deep, well drained, fertile, medium textured & relatively more clay soil. pH = 6 – 7.5	Baghu Gosha, Conference, Early China, Bartlett, Favourite, Hardy, Nashpati, Kieffer	→ Commercially – Shield (T) budding. → Rootstocks – generally used are wild Himalayan pears	→ Size of pits – 1 × 1 × 1 m → Spacing – initially – 3 × 2 m later changed – 6 × 4 m (4–5 yrs)
C.N. – Plum S.N. – Prunus domestica (European) Prunus salicina (Japanese) F – Rosaceae Ori. – European – Caspian sea, Japanese – China.	→ Temperate fruit → European – below 7.2°C for 800–1000 hrs for winter chilling → Japanese – lower chilling, i.e., 700–800 hrs. below 7.2°C → Rainfall :– 100–125 cm → Soil – Deep sandy loam soil, good drainage.	Santa Rosa, Beauty, Grand duke, Plum red, Kelsey, Wickson, Bur bank, Victoria.	→ Commercially by Grafting & budding – Tongue grafting – Chip budding – T budding → Rootstocks – Wild apricot, Myrobalon B plum	→ Pit size – 60 cm³ → Spacing – 5–6 m

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MANURE & FERTILIZER	IRRIGATION	TIME OF PLANTING
→ Non-bearing trees :- N = 454 g /tree/yr. → Bearing trees :- NPK = 1100 : 2200 : 1100 g → 15-25 tonnes/ha - FYM	→ There should be sufficient moisture in soil. → Frequent irrigations are needed during fruit development. Atleast two irrigations during fruit development. → Irrigation should be stopped a few days before harvesting.	→ Planting - Winter season → Pits are dug during Sept.-Oct → Harvesting - mid May - mid July → Yield - 50-125 kg in hills
→ NPK = 600 : 150 : 300 g/tree/yr. → Ca-deficiency causes black end & cork spot disorders		→ Fully mature fruits are harvested for fresh consumption. → Still green & firm fruits for canning & distant markets. → Harvesting done in 2-3 pickings at 3-4 days interval. → Yield - 30-40 tonnes/ha/yr.
→ FYM = 40 kg → NPK = 500 : 250 : 700 g → Full FYM, P & K applied during Dec & Jan. → Half N - spring before flowering & remaining half month later.	→ Requires adequate amount of water. → In India most orchards are on sloppy land growing under rainfed conditions. → Peak water requirement period - May - June	→ Planting - Spring → It does not attain full ripe edible quality on tree. So fruits should be picked at proper stage of maturity. → Yield - 60-70 kg fruits

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