

INTERNATIONAL AVOCADO CANOPY MANAGEMENT SURVEY

DAF, September 2022

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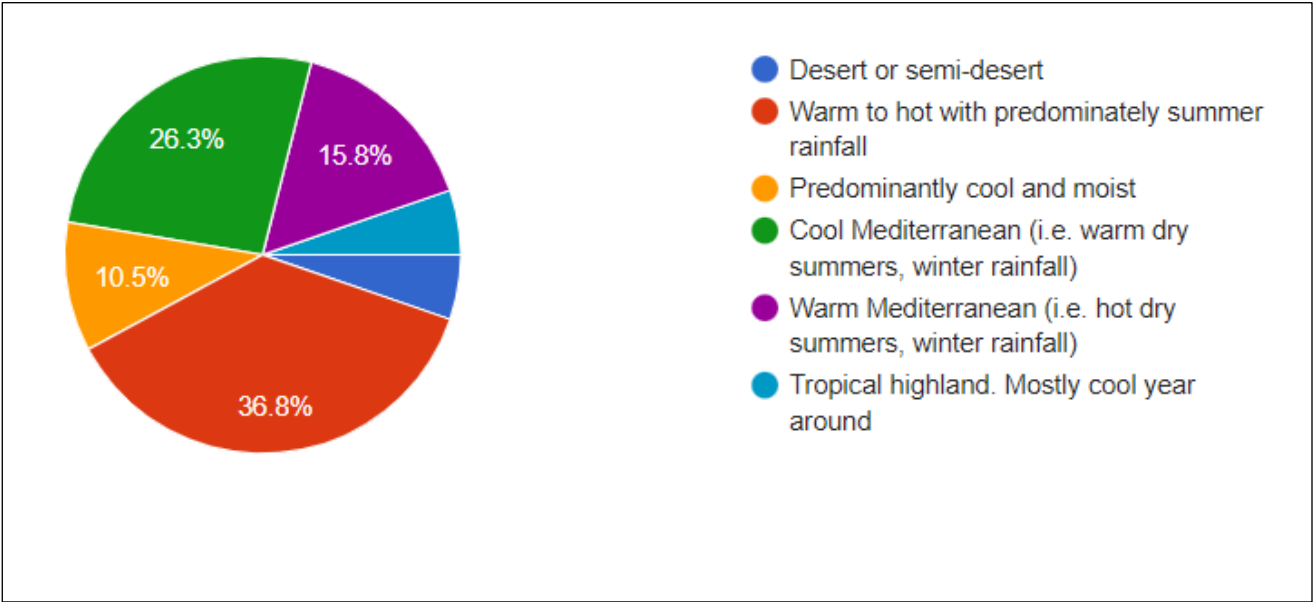
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COUNTRIES and CLIMATES

| COUNTRY | NUMBER RECEIVED |
|-----------------|-----------------|
| New Zealand | 2 |
| South Africa | 6 |
| Zimbabwe | 1 |
| Tanzania | 2 |
| Israel | 2 |
| Spain | 1 |
| Chile | 1 |
| Peru | 1 |
| Colombia | 1 |
| Mexico | 1 |
| California, USA | 1 |
| | 19 |

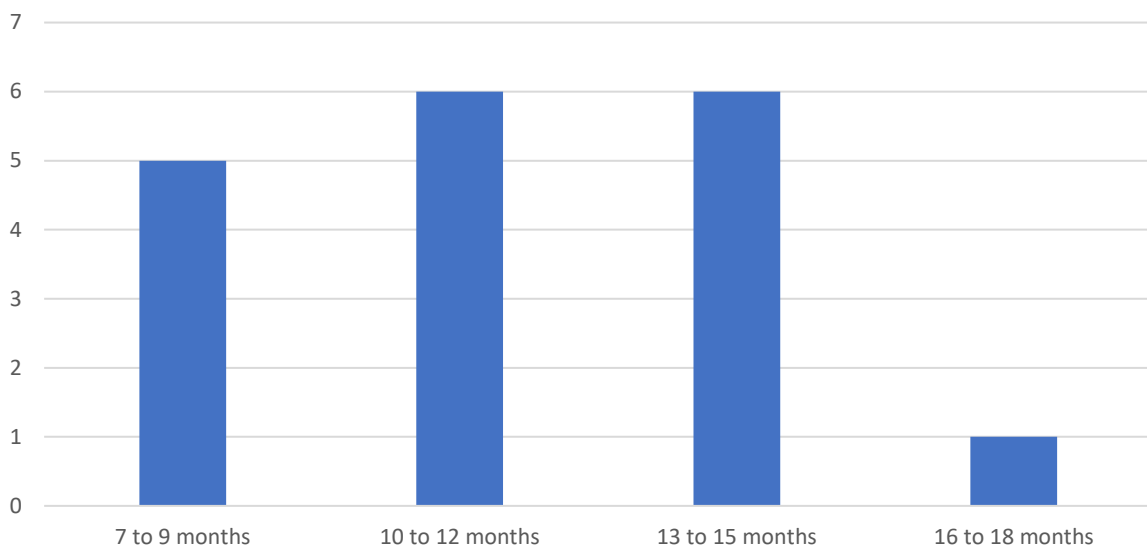
| CLIMATES | COUNTRIES | NUMBER OF RESPONDENTS |
|---|---|-----------------------|
| Cool Mediterranean (warm dry summers, winter rainfall) | Chile, California, New Zealand & South Africa (Cape Province) | 5 |
| Warm Mediterranean (hot dry summers, winter rainfall) | Israel & Spain | 3 |
| Warm to hot, predominantly summer rainfall (subtropics) | South Africa, Zimbabwe, Tanzania, Mexico | 7 |
| Tropical highland, 6,000 feet, mostly cool all year | Tanzania | 1 |
| Predominantly cool & moist | Colombia, South Africa (Cape Province) | 2 |
| Desert or semi desert | Peru | 1 |
| | | 19 |



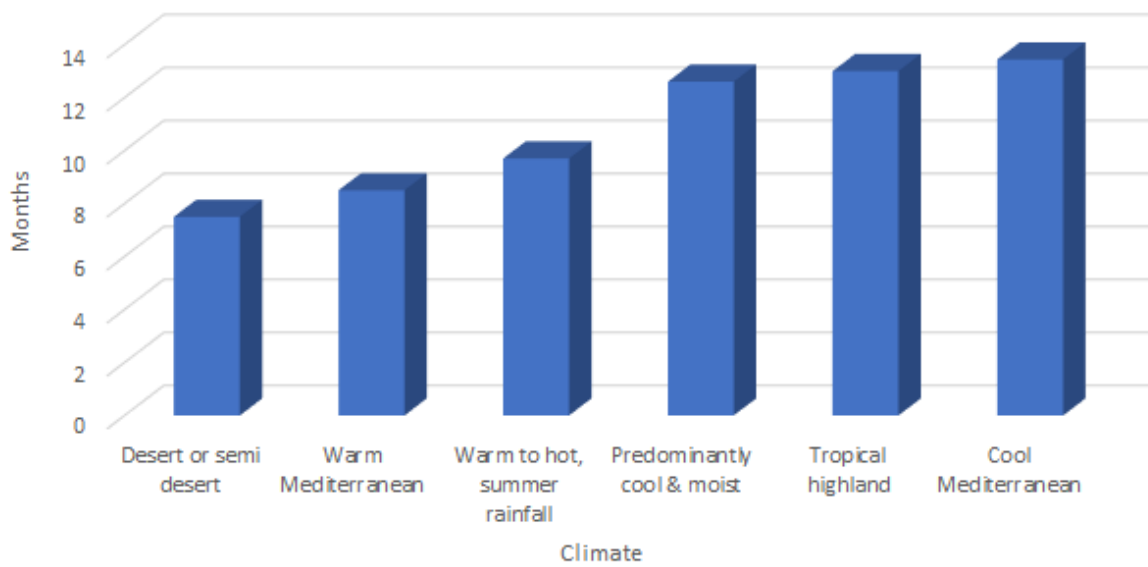
HASS FLOWERING, HARVEST TIMES and TIME FROM FRUITSET TO HARVEST

| CLIMATE | REGION | MAIN MONTHS OF FLOWERING (S. hemisphere equivalent) | MAIN MONTHS OF HARVEST (S. hemisphere equivalent) | TYPICAL TIME PERIOD (months) FROM FRUITSET TO HARVEST |
|---|-------------------------------|--|--|--|
| Cool Mediterranean (warm dry summers, winter rainfall) | S Africa, Cape | Oct | Oct | 12 |
| | Calif | Sep, Oct, Nov, Dec | Oct, Nov, Dec, Jan, Feb | 13 – 20 |
| | Chile | Oct, Nov | Oct, Nov, Dec, Jan | 10 – 12 |
| | NZ | Sep, Oct | Sep, Oct, Nov, Dec, Jan, Feb | 11 – 17 |
| | NZ | Sep, Oct, Nov | Sep, Oct, Nov, Dec, Jan, Feb | 12 - 14 |
| Warm Mediterranean (hot dry summers, winter rainfall). Israel & Spain | Israel | Sep, Oct | Apr, May, Jun, Jul, Aug, Sep, Oct | 8 – 10 |
| | Israel | Sep, Oct | Jun, Jul, Aug, Sep, Oct | 8 – 12 |
| | Spain | Sep, Oct | Jun, Jul, Aug, Sep, Oct | 9 |
| Warm to hot, predominantly summer rainfall | S Africa, Tzaneen | Jul, Aug, Sep | Apr, May, Jun, Jul, Aug | Depends on area and if hung late |
| | S Africa, Natal | Aug, Sep | Jul, Aug, Sep | 10 |
| | Tanzania 1 | Jun, Sep | Aug, Sep, Oct, Nov | 13 |
| | Zimbabwe | Aug, Sep | Apr, May, Jun | 7 – 10 |
| | S Africa | Aug | Feb, Mar, Apr | 6 – 8 |
| | S Africa | Jul, Aug, Sep | Mar, Apr, May, Jun, Jul | 10 |
| Mexico | Jul, Aug, Sep & Apr, May, Jun | Jul, Aug, Sep, Oct, Nov & Feb, Mar, Apr, May, Jun | 10 - 14 | |
| Tropical highland, mostly cool all year | Tanzania 2 (6000') | Aug, Sep | Aug, Sep, Oct, Nov | 12 - 14 |
| Predominantly cool & moist | S Africa, Cape Province | Aug, Sep, Oct | Oct, Nov, Dec, Jan | 12 – 14 |
| | Colombia | Jul, Jan | Jul | 12 |
| Desert or semi desert | Peru | Sep, Oct, Nov | Apr, May, Jun, Jul, Aug | 7 - 8 |

MONTHS FROM FRUITSET TO HARVEST



MONTHS FROM FRUITSET TO HARVEST

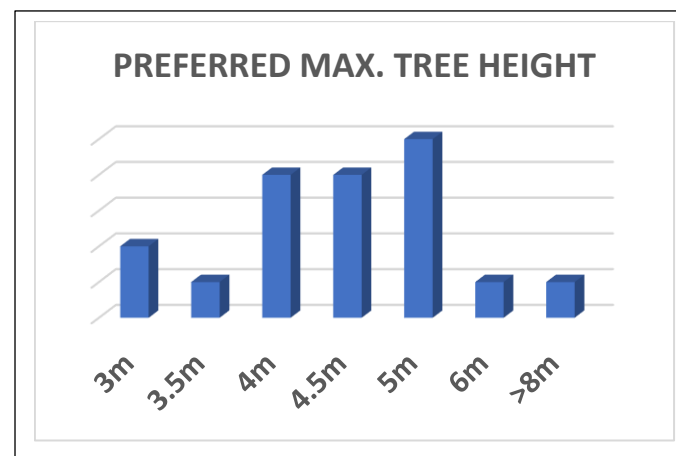
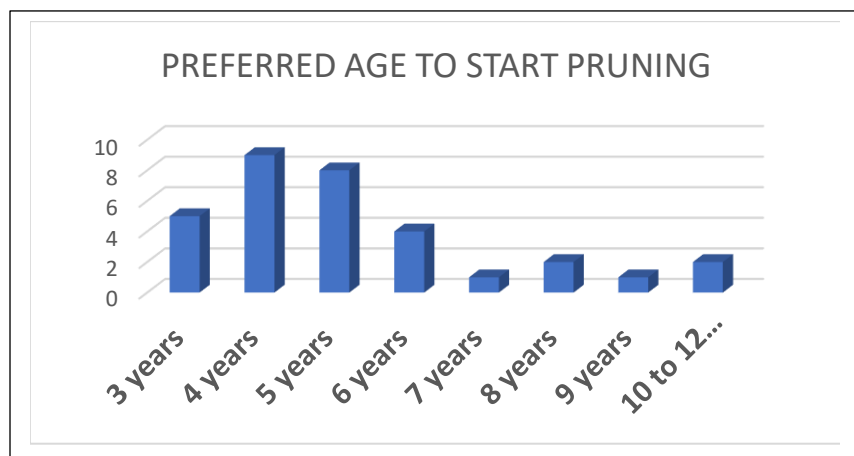


OUT OF SEASON FLOWERING

| CLIMATE | YES | NO |
|--|---|--|
| Cool Mediterranean | 2 <ul style="list-style-type: none"> The trees might flower all winter, through spring and early summer if the conditions are right, but main crop is set late spring (Calif) Winter or Autumn set does occur, but seldom in commercial quantity (NZ) | 3 <ul style="list-style-type: none"> Under cold winter the phenology is homogeneous during the year (Chile) Some out of season flowering from Carmen that is harvested for domestic market, but this is limited. |
| Warm Mediterranean | - | 3 |
| Warm to hot, summer rain predominantly | 5 <ul style="list-style-type: none"> Some years and some areas there is out of season flowering June flower Mainly an early area so management is geared to that This does not happen every year but occasionally | 2 |
| Tropical highland | 1 <ul style="list-style-type: none"> A small random flowering resulting in a small harvest | |
| Predominantly cool & moist | 1 | 1 |
| Desert or semi desert | - | 1 |

TREE SPACING, PREFERRED TREE HEIGHT and PREFERRED AGE TO START PRUNING

| CLIMATE | REGION | TREE SPACING (m) | PREFERRED MAX TREE HEIGHT (m) | PREFERRED AGE TO START PRUNING |
|----------------------------|-----------------|------------------|-------------------------------|--------------------------------|
| Cool Mediterranean | S Africa, Cape | 6x3 | 3m | 3 |
| | Calif | 6x6 | 5m (Calif) | 8 – 10 |
| | Chile | 3x3, 5x2, 6x3 | 3m (Chile) | 3 (high density) – 5 |
| | NZ | 7x7 | 5m | 5 – 7 |
| | NZ | 9x9 | 6m | 4 |
| Warm Mediterranean | Israel | 6x3 & 6x4 | 4.5m | 5 – 6 |
| | Israel | 6x4 | 4.5m | 4 – 5 |
| | Spain | 6x6 | 4m | 6 |
| Warm to hot, summer rain | S Africa | 7x4 | - | 4 |
| | S Africa, Natal | 8x5 | 5m | 4 |
| | Tanzania 1 | 7x3.5 | 4m | 4 |
| | Zimbabwe | 7x7 | 4 to 5m | 8 |
| | S Africa | 7to9x5 | 5m | 4 to 5 |
| | S Africa | 7x6, 8x4 | 4 or 5m | 3 or 5 depends on variety |
| Tropical highland | Mexico | 10x10 | >8m | 10 to 12 |
| | Tanzania 2 | 8x4 | 5m | 5+ |
| Predominantly cool & moist | S Africa, Cape | 6x4 | 3.5m | 5 |
| | Colombia | 6x3 | 4m | 3 |
| Desert or semi-desert | Peru | 6x4 | 4m | 3 to 4 |



ROOTSTOCKS and THEIR EFFECT ON CANOPY MANAGEMENT

| CLIMATE | TYPE | ROOTSTOCKS | ROOTSTOCK AFFECT ON CANOPY MNGT? |
|--|--|--|--|
| Cool Mediterranean (warm dry summers, winter rainfall) | Clonal Clonal Both Both Both | Dusa Dusa, Toro Canyon, Duke 7 Zutano, Velvick, WI* for salt, clonal Dusa Historically Zutano. New on Dusa, Bounty & SR1 Seedling Zutano & clonal Dusa | - - Anticipate will affect start-date of pruning. Bounty more vigorous than Dusa. No |
| Warm Mediterranean (hot dry summers, winter rainfall). Israel & Spain | Seedling Seedling Both | All WI*: Degania 117, Ashdot17, Zrifin 99 All WI*: Degania 117, Ashdot 17, Ferchaild, Degania 62, Zrifin 99 Duke 7 | - No effect - |
| Warm to hot, predominantly summer rainfall | Clonal Clonal Seedling Clonal Clonal Both Seedling | Dusa Dusa - Dusa Dusa, Bounty, Velvick, Edranol, Duke 7 Dusa & Bounty - | Some rootstocks more vigorous - - Yes Vigorous ones definitely = more pruning No obvious effects on healthy trees Yes it has an influence. |
| Tropical highland, mostly cool all year | Seedling | - | - |
| Predominantly cool & moist | Clonal Both | Dusa Natives, Duke 7, Latas | - Yes, it does influence, e.g. Duke 7, induces greater vegetative development. |
| Desert or semi-desert | Seedling | Zutano, West Indian. Use of clonals is in initial stage | - |

* WI . . . West Indian

EARLY TREE TRAINING – NURSERY and EARLY YEARS IN ORCHARD

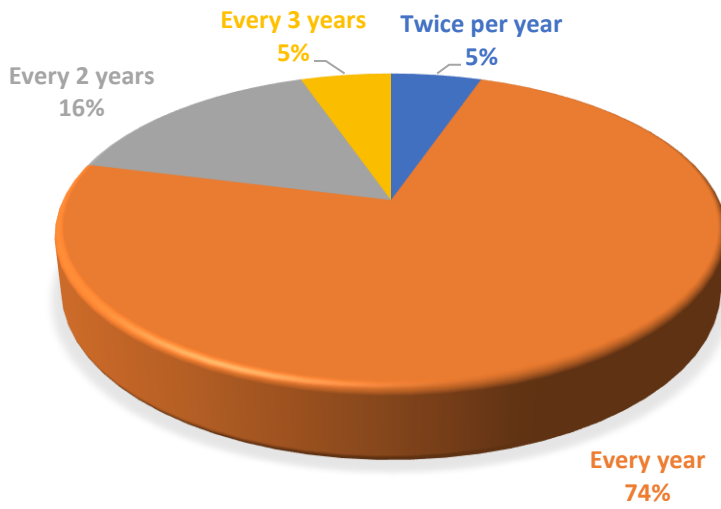
| CLIMATE | MEASURES TAKEN TO TRAIN TREES IN NURSERY | MEASURES TAKEN IN 1 ST 2 OR 3 YEARS IN ORCHARD TO TRAIN OR SHAPE |
|--------------------------|--|--|
| Cool Medit. | No Pinching out tips for branching No No Training to a central leader | Pinching out tips for branching & training to central leader No Training to central leader Branches below ~60cm are removed in Yr 2 to improve sprinkler coverage & encourage single main trunk. Other training is not common. Pinching out tips, training to central leader & 3 to 5 main branches |
| Warm Medit. | Pinching out tips for branching Pinching out tips for branching Training to a central leader | Pinching out tips for branching Pinching out tips for branching & training to about 3 to 5 main branches Training to about 3 to 5 main branches |
| Warm to hot, summer rain | Pinching out tips for branching No Pinching out tips for branching No No Train to central leader but for space efficiency in nursery Pinching out tips for branching | Pinching out tips for branching & training to about 3 to 5 main branches No No Pinching out tips for branching & training to about 3 to 5 main branches Pinching out tips for branching & training to central leader Removing central leaders to encourage 3 or 4 main branches to allow for an open bowl/vase tree shape Training to about 3 to 5 main branches |
| Tropical highland | Pinching out tips for branching | Pinching out tips for branching |
| Predom. cool & moist | Training to a central leader Training to a central leader | No Training to a central leader |
| Desert or semi desert | No | |

THE MAIN PRUNING - FREQUENCY, BEST TIME OF YEAR and CONSEQUENCES OF POOR TIMING

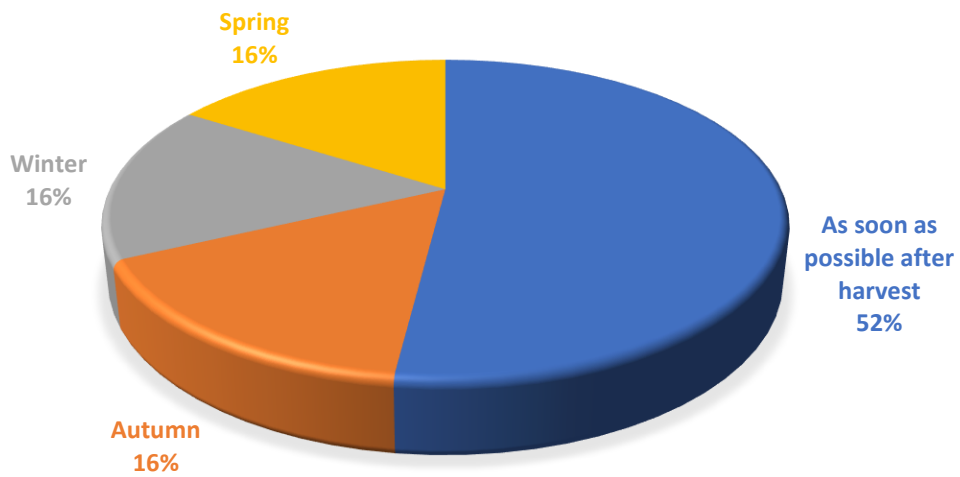
| CLIMATE | REGION | HOW OFTEN MAJOR PRUNING CONDUCTED | BEST TIME OF YEAR TO PRUNE | CONSEQUENCES OF PRUNING TOO <u>EARLY</u> IN THE SEASON | CONSEQUENCES OF PRUNING TOO <u>LATE</u> IN THE SEASON |
|-----------------------------|-------------------|-----------------------------------|---|--|---|
| Cool Medit. | S Africa, Cape | Every year | Spring | - | Trees too dense |
| | Calif | Every year | After harvest, or winter if not much fruit | Rarely happens, usually too late | Canopy grows too much and too much needs to be taken out Lose flower potential for next season |
| | Chile | Every year | ASAP after harvest | Early in winter is better | More vigorous regrowth if healthy trees pruned in spring that requires additional follow up |
| | NZ | Every year | Autumn and winter for healthy trees and spring for sick trees | Sunburn possible, fruit still on tree can be lost. | Less regrowth but this can be desirable |
| | NZ | Every 2 years | First major prune in spring, then groom in autumn | If a major prune, sunburn on exposed limbs & very vigorous watershoot regrowth | |
| Warm Medit. | Israel | Every 2 years | End of winter | Risk of frost damage | Risk of heat wave damage |
| | Israel | Twice per year | ASAP after harvest | Risk of frost and early closing of rows | Miss the effect of open orchard (light) on differentiation, flowering & set. |
| | Spain | Every year | ASAP after harvest | Usually, lower yields are obtained that year since less flowering will occur | Flowering next year will be reduced since there will be no time for the summer flush to develop |
| Warm to hot, summer rain | S Africa, Tzaneen | Every year | ASAP after harvest | Regrowth | Damage to flowers |
| | S Africa, Natal | Every year | Spring | We have fruit on the trees so we don't prune early | Damage new fruitset |
| | Tanzania 1 | Every year | ASAP after harvest | Fruit is lost | Wasted energy on flower and fruitset |
| | Zimbabwe | Every year | ASAP after harvest | - | Affect following crop |
| | S Africa | Every year | Previously pruned after harvest (late | Much regrowth and reduced fruitset | Difficult to make the pruning decisions with flower and fruit on the tree |

| | | | | | |
|-----------------------|--------------------|--|--|--|--|
| | S Africa | Every year | summer/early autumn) but due to early area had too much regrowth, now prune later as season changes (temps dropping) in Autumn ASAP after harvest (autumn & winter) | Trees can become too vegetative especially if big cuts were made. | Flowers get cut off but is this a negative or positive? |
| | Mexico | Every 3 years | ASAP after harvest | You lose production | You lose fruit |
| Tropical highland | Tanzania 2 (6000') | Every 2 years | ASAP after harvest | Loss of fruit | Growing fruit will be pruned off |
| Predom. cool & moist | S Africa, Cape | Every year | ASAP after harvest | Current year crop loss, excessive growth | Next season crop loss |
| | Colombia | Every year | ASAP after harvest | It brings the flowering earlier the next year. | It delays the subsequent flowering |
| Desert or semi desert | Peru | Every year | ASAP after harvest | One would be able to bring the flowering earlier one or two weeks in some branches | One would be pruning during full flowering |
| CLIMATE | REGION | HOW OFTEN MAJOR PRUNING CONDUCTED | BEST TIME OF YEAR TO PRUNE | CONSEQUENCES OF PRUNING TOO <u>EARLY</u> IN THE SEASON | CONSEQUENCES OF PRUNING TOO <u>LATE</u> IN THE SEASON |

FREQUENCY OF PRUNING



BEST TIME OF YEAR TO PRUNE

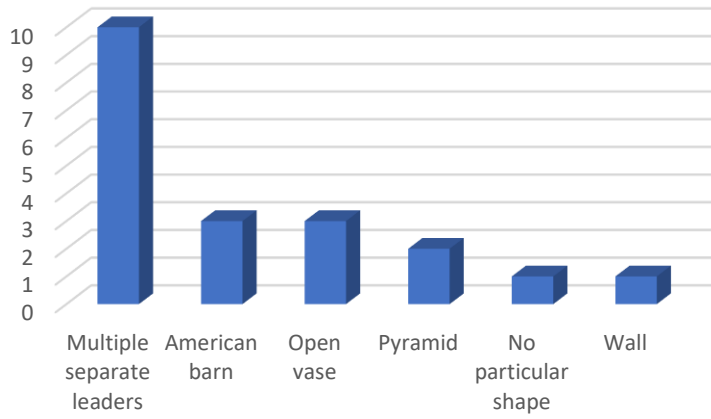


a) TREE SHAPE b) MAJOR PRUNING METHOD c) PROPORTION OF CANOPY REMOVED

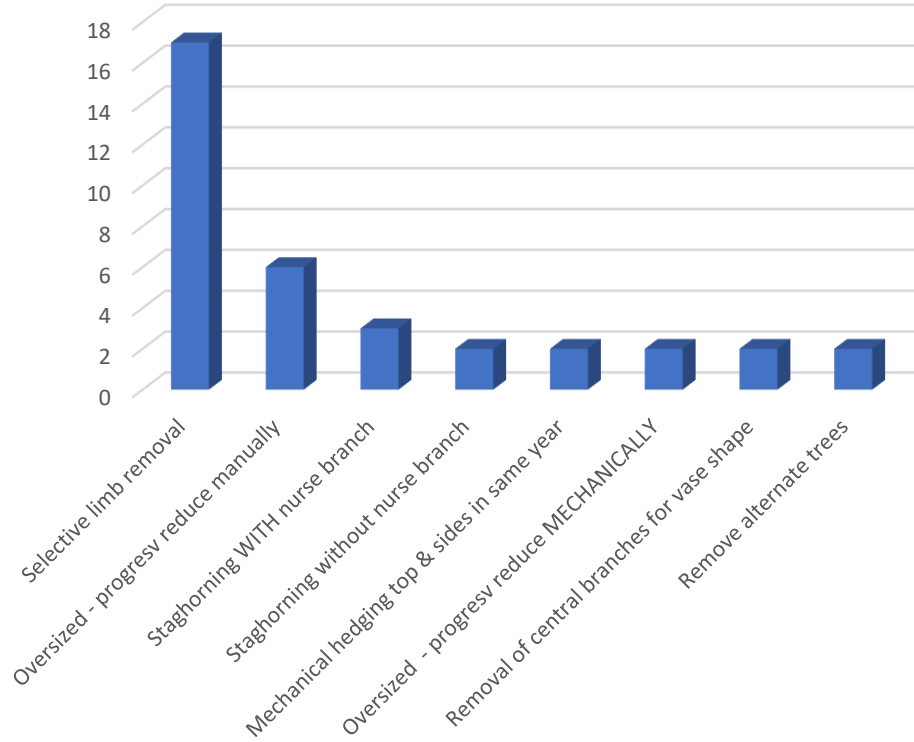
| CLIMATE | REGION | TREE SHAPE PREFERRED | COMMON PRUNING METHOD(S) | % REMOVED | % REMOVED THAT CAUSES EXCESS VEGETATIVE TREES |
|--------------------------|-------------------|--|--|-----------|--|
| Cool Mediterranean | S Africa, Cape | Pyramid | Selective limb removal – manual | 20% | 30% |
| | Calif | Multiple separate leaders | Selective limb removal – manual, Staghorning w/o nurse branch & removing alternate trees | 15% | Limit cuts to thinning, avoiding heading cuts if possible 50% |
| | Chile | No particular shape: incl 'walls' | Over-sized trees - progressive reduction of size by removing one or more major limbs per year over several years. Selective limb removal – manual, Over-sized trees - progressive reduction of size by removing one or more major limbs per year over several years | 25 – 30% | 40% |
| | NZ | Multiple separate leaders | Selective limb removal – manual, Over-sized trees - progressive reduction of size by removing one or more major limbs per year over several years | 30% | 50% |
| Warm Mediterranean | Israel | Multiple separate leaders | Selective limb removal – manual | 25% | More than 30% |
| | Israel | Combination of American barn (sometimes coming to each side once every second year) + removing one main limb every year' | Selective limb removal – manual, Mechanical hedging top and sides in same year, Over-sized trees - progressive reduction of size by MECHANICAL hedging, one side or top at a time, over several years | 15-20% | More than 30% |
| | Spain | Open vase | Selective limb removal – manual | 20% | 40% |
| Warm to hot, summer rain | S Africa, Tzaneen | Multiple separate leaders | Selective limb removal – manual, Over-sized trees - progressive reduction of size by removing one or more major limbs per year over several years. | 15-20% | 35% |
| | S Africa, Natal | Multiple separate leaders | Selective limb removal – manual | 20% | 25% |
| | Tanzania 1 | Multiple separate leaders | Selective limb removal – manual | 7% | No |
| | Zimbabwe | Multiple separate leaders | Selective limb removal – manual, Staghorning, with & without a temporary 'nurse' branch, | 20% | Not sure |

| | | | | | |
|----------------------------|--------------------|--|--|-----------|---|
| | S Africa | American barn. The shape depends on variety and spacing. For instance Pinkerton is difficult to get into a typical shape in wider plantings. Maluma and Lamb Hass and to lesser degree Hass shapes easily into a central leader upright tree where Fuerte a more barn shape rather than a central leader is typical. | Selective limb removal – manual, Over-sized trees - progressive reduction of size by removing one or more major limbs per year over several years. | 15-20% | Yes, 30% |
| | S Africa | Open vase. This depends on cultivar. Pinkerton will be more multiple separate leaders as this is how it naturally grows but generally we aim for open bowl / vase shape | Selective limb removal – manual, Over-sized trees - progressive reduction of size by MECHANICAL hedging, one side or top at a time, over several years, Removal of central branches to create an open vase shape, Staghorning, keeping a temporary ‘nurse’ branch, Removing alternate trees. Mechanical is only used when time is short or orchards are very overgrown. Must be followed up by manual pruning. Tree removal would only be done in older orchards with difficult spacings. | 30% | 30-40% |
| | Mexico | Multiple separate leaders | Selective limb removal – manual, Over-sized trees - progressive reduction of size by removing one or more major limbs per year over several years, Staghorning, keeping a temporary ‘nurse’ branch | - | I don’t know |
| Tropical highland | Tanzania 2 (6000’) | Open vase | Selective limb removal – manual, Removal of central branches to create an open vase shape | 20% | Our trees are not vegetative unless very heavily pruned. |
| Predominantly cool & moist | S Africa, Cape. | Multiple separate leaders | Selective limb removal – manual | 25% | 35% |
| | Colombia | Pyramid | Mechanical hedging top and sides in same year | 20% | 30% |
| Desert or semi desert | Peru | American barn shape | Selective limb removal – manual, Over-sized trees - progressive reduction of size by removing one or more major limbs per year over several years | 15 to 20% | If you prune off more than 30% you are able to have a reduction in the yield. Don't attempt pruning during the flowering after the flower is already established. |

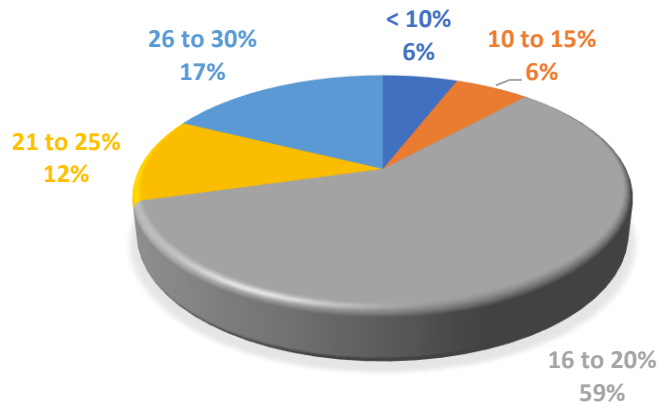
PREFERRED TREE SHAPE



PRUNING METHODS



% CANOPY REMOVED EACH YEAR



NEW or EXPERIMENTAL PRUNING STRATEGIES

| CLIMATE | LOCATION | NEW OR EXPERIMENTAL STRATEGIES |
|--------------------------|--------------|--|
| Cool Medit. | California | Stub pruning, leaving about 45 cm of branch at the trunk to encourage new growth. It tends to crowd too fast though. |
| | Chile | 'Walls' |
| | NZ | Starting to experiment with establishing a 2D canopy through establishing horizontal structural limbs and vertical productive shoots that come off. |
| | NZ | A few pioneering growers are trying various systems involving tying limbs to wires |
| Warm Medit. | Israel | Mechanical hedging top and sides. One row in Year 1, the other row in Year 2. |
| | Israel | We are trying new methods all the time. |
| Warm to hot, summer rain | South Africa | Later in the season pruning (positive result), trying out other strategies i.e. multi leaders, one major limb removed (cutting out 20-25% of the tree with one cut - seem to work in rehab conditions), continuous pruning. Still figuring out how to manage nutrition with the "late prune". Fuerte (and Pinkerton) seems to work well but Hass and other Hass types sometimes remaining too sparse too long. |
| | South Africa | Central leader on Maluma with closer spacings - trees are still young |

MINOR PRUNING METHODS

| CLIMATE | LOCATION | MINOR PRUNING METHODS | | | | |
|--------------------------|--------------|---|--|---|----------|---------|
| | | Correctional pruning e.g. erratic branches, thinning out water shoots etc | Light mechanical trimming of hedged surfaces | Manually thinning out regrowth after limb removal | Skirting | Other |
| Cool Medit. | South Africa | | | Y | | |
| | California | Y | | Y | Y | |
| | Chile | Y | | Y | Y | |
| | NZ | Y | | Y | | |
| | NZ | Y | | Y | | |
| Warm Medit. | Israel | | | Y | Y | |
| | Israel | | Y | Y | Y | |
| | Spain | Y | | Y | Y | |
| Warm to hot, summer rain | South Africa | | Y | | | |
| | Tanzania | Y | | | | |
| | Zimbabwe | Y | | Y | | Tipping |
| | South Africa | Y | | Y | | Tipping |
| | South Africa | Y | | Y | | |
| Mexico | Y | | Y | Y | | |
| Tropical highland | - | | | | | |
| Predom. cool & moist | Colombia | | | | Y | |
| Desert or semi desert | Peru | Y | | | Y | |

CINCTURING

| CLIMATE | LOCATION | CINCTURING | SUCCESS OR FAILURE OF CINCTURING |
|--------------------------|--------------|------------|---|
| Cool Medit. | California | Y | Very successful |
| | Chile | Sometimes | Works for a secure bloom in off season. The limbs start to be old. Less vigour. |
| | NZ | N | Girdling has not been very successful under NZ conditions. |
| Warm Medit. | Israel | Sometimes | The growers conduct it (minority) & believe it is very successful. My personal opinion based on long experience and research - Zero!! |
| Warm to hot, summer rain | South Africa | Sometimes | It does work. |
| Desert or semi desert | Peru | Sometimes | Yes, it is successful to promote a better flowering. |

a) PHYTOPHTHORA b) PRUNING IN AN 'OFF' YEAR

| CLIMATE | LOCATION | a) DOES PHYTOPHTHORA AFFECT PRUNING DECISIONS? | b) PREFER TO PRUNE IN AN 'OFF' YEAR? | b) DOES PRUNING IN AN 'OFF' YEAR MAKE TREES MORE VEGETATIVE? |
|-------------|--------------|--|--------------------------------------|--|
| Cool Medit. | South Africa | No | Yes | No |
| | California | Treat first then prune. | Yes | No, they have the labour and it fits in with their practices. |
| | Chile | Only to recover trees | Yes | Yes, I don't agree but the growers tend to do it. |
| | NZ | Yes. Sick trees are often pruned anytime from autumn through to spring to balance canopy to root volume as part of recovery. Ideal that fruit removed ASAP and then tree pruned in spring. | Yes | No, generally trees in 'off' year flower heavily in spring with subsequent fruit set limiting vegetative growth. |

| | | | | |
|--------------------------|--|--|--|--|
| | NZ | Yes, trees can be invigorated by heavier pruning. | Yes | No |
| Warm Medit. | Israel Israel Spain | No No Only in affected trees to remove some branches. | No No No preference | No, it has no connection |
| Warm to hot, summer rain | South Africa | Less vigorous trees need less pruning, very sick trees may be staghorned. | No | Yes, it definitely does. |
| | South Africa | No | No | N/A |
| | Tanzania | No | Yes | No |
| | Zimbabwe | No | Yes | Yes |
| | South Africa | Yes. Stressed trees or trees with poorer condition gets different strategy depending on the condition. Cutting back harder on sick trees, earlier pruning etc. | No | Vigorous area so pruning is done annually. Some years may require harder prune and height control but because fruits are off when pruning is done decisions are fairly easy. |
| South Africa | Yes - severely affected trees will get harder cuts (followed by tree painting) - this assists in tree rejuvenation | No preference | Possibly but not 100% sure | |
| Mexico | Yes | No preference | Yes. | |
| Tropical highland | Tanzania | A sick tree will be pruned more. | No preference | We have little vegetative growth here, we need more. |
| Predom. Cool & moist | South Africa | No | No | Yes |
| | Colombia | It reduces root rot. | No | No |
| Desert or semi desert | Peru | If the tree is sick, it is best to carry out intense pruning and conduct phytosanitary/pesticide treatment. | No | It is best to prune every year. |
| CLIMATE | LOCATION | DOES PHYTOPHTHORA AFFECT PRUNING DECISIONS? | PREFER TO PRUNE IN AN 'OFF' YEAR? | DOES PRUNING IN AN 'OFF' YEAR MAKE TREES MORE VEGETATIVE? |

PLANT GROWTH REGULATORS

Abbreviations: Unico = uniconazole Paclo = paclobutrazol GA = Gibberellic acid NAA = Naphthalene acetic acid Cyto = cytokinins

| CLIMATE | LOCATION | PGRs IN CANOPY MNGT | THOSE USED | WHEN APPLIED | HOW APPLIED | FUTURE OF PGRs? | NEW PGR STRATEGIES? |
|-------------|--------------|---------------------|-------------------------|---|----------------------|--|---|
| Cool Medit. | South Africa | Y | Unico | At flowering & Sumr/autm leaf flush | Foliar | Yes | - |
| | California | Y | GA, NAA to pruning cuts | At flowering & pruning cuts | Foliar | Unico & paclo not registered in US & won't be | |
| | Chile | Sometimes | Unico | At flowering & Sumr/autm leaf flush | Foliar | Under Chilean conditions we never found residue. | |
| | NZ | Y | Paclo, Unico, GA | Paclo as soil drench in spring & as required through growing phase. Unico limited to 10-15cm spring vegetative flush devpt, GA use limited but some success with March application (autumn) to prevent flower differentiation in newly planted trees. | Soil drench & foliar | Expect will be phased out over time. Some larger orchards using wider tree spacing with this in mind. | |
| | NZ | Sometimes | Unico | At flowering | Foliar | | |
| Warm Medit. | Israel | Researching | Unico | Autumn | Through irrigation | There are no residues. I think it will be accepted. | Still studying |
| | Israel | Y | Unico & GA | At flowering & Sumr/autm leaf flush | Foliar | Not so far, in the future it may be an issue. | Trying all the time. Some positive effects in early experiments, difficult to translate to commercial protocols |
| | Spain | N | | | | PGRs are not allowed in Europe, & I think that in the future fruit produced with PGRs may not be accepted. | |

| | | | | | | | |
|--------------------------|-----------------|----------------------------|---|-------------------------------------|--------------------|--|---|
| Warm to hot, summer rain | South Africa | Y | Unico | At flowering | Foliar | Who knows! | Summer unico experimental to manage vigour & testing MRLs. Testing to come in earlier in orchard life with unico & paclo (especially in high vigour situations, varieties, rootstocks, soils, areas) to get trees to make a proper first yield. |
| | South Africa | N | | | | I think it causes more alternate bearing. | |
| | South Africa | Sometimes | Unico, Paclo | At flowering & sumr/autm leaf flush | Foliar | It is a concern for the vigorous areas. | |
| | South Africa | Sometimes | Unico | At flowering | Foliar | Uniconazole is a red flag product for some supermarkets but at this stage not too worried. It is necessary to use them. | |
| Mexico | | | | | | | |
| Tropical highland | Tanzania | | | | | 'Not needed here'. | |
| Predom. cool & moist | South Africa | | | | Pole brush | Has to be properly studied. Multiple PGR's are used routinely in apple production. | Trehold® (NAA) in latex should be considered as a pruning stub treatment. |
| | Colombia | Y | Unico | At flowering | Foliar | Yes. They need to look for other alternatives. | Cyto & seaweeds |
| Desert or semi desert | Peru | Y | Unico. GA on young trees to reduce flower intensity | At flowering | Foliar | You should apply taking into account the period of care (withholding period). | |
| CLIMATE | LOCATION | PGRs IN CANOPY MNGT | THOSE USED | WHEN APPLIED | HOW APPLIED | FUTURE OF PGRs? | NEW PGR STRATEGIES? |

a) PRUNING WHERE THERE IS ALWAYS FRUIT ON TREE b) OTHER COMMENTS c) RESEARCH NEEDED

| CLIMATE | LOCATION | a) CANOPY MGMT TO REDUCE LOSSES WHERE ALWAYS FRUIT ON TREE | b) OTHER COMMENTS ABOUT CANOPY MGMT | c) AREAS OF RESEARCH IN CANOPY MGMT |
|--------------------------|--------------------------|---|---|---|
| Cool Medit. | South Africa | Prune after picking | | Improving fruitset More 2D canopy research to allow orchard efficiency and use of new Agritech. The economics of the most commonly employed systems |
| | California | Prune in winter before flowering, but no one does | It's hard to do. Labour hard to find, especially qualified pruners | |
| | Chile | Prune & girdling | | |
| | NZ | Selective limb removal with tagging of limbs with fruit for removal ASAP or the following year. | Very diverse approaches but successful ones have common principles of maximising light interception, considerate of spray and harvest access, rejuvenation of wood to create different aged wood in tree, managing crop load. | |
| | NZ | Mark limbs for removal in advance, then strip pick those limbs so they can be removed as soon after harvest as desired. | Once started, it can never stop. Doing something is better than doing nothing. If using contractors, the simpler the system used the better. | |
| Warm Medit. | Israel | Close the eyes and prune. | | Optimizing canopy management for each variety/rootstock combination |
| | Spain | No experience in this. | | |
| Warm to hot, summer rain | South Africa | | None, it's something we know more than 20 years ago but still not enough | Yes, most definitely |
| | South Africa Tanzania | Limb removal after harvest. | | Different strategies for different areas. |
| | South Africa | Central leader system | I find it interesting that most (all) fruit industries have been working with positive productivity effect (at least since the 80s) towards central leader | Warm area pruning timings (with nutrition). Timings for different varieties. Maintenance pruning strategies to minimise unwanted |

| | | | | |
|-----------------------|-----------------|--|---|---|
| | South Africa | | training systems but we see recent moves in the avocado industry to relook at open vases. Tree spacing determines canopy management strategy. | regrowth and maintain productivity. PGR use (soil application, via drip irrigation applications). Vigour/growth regulation in future PGR-free situations. Rootstocks with PRR resistance without high vigour :) |
| | Mexico | Prune part of the tree one year, another part in another year, and successively like this. | Pruning, in an ideal world, should be done all year round. But increasing labour costs make this ideal difficult to achieve on many farms. | Some growers in SA swear by central leader pruning (NB Hass). It would be good to do a comparison with open bowl/vase pruning in one area / orchard to see the impact. |
| Tropical highland | Tanzania | Prune as soon as possible after harvest | | |
| Predom. Cool & moist | South Africa | Selective pruning of whole limbs. | | |
| | Colombia | To favour/support more the principal flowering and attempt to get the tree to bear more (fruit) from this. | | How to avoid off-season ('naughty') flowering. |
| Desert or semi desert | Peru | In Peru, the harvest takes place during a defined stage. | | Yes, mechanized pruning. |
| CLIMATE | LOCATION | CANOPY MGMT TO REDUCE LOSSES WHERE ALWAYS FRUIT ON TREE | OTHER COMMENTS ABOUT CANOPY MGMT | AREAS OF RESEARCH IN CANOPY MGMT |

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