

Flavor Fall Production Manual/Protocol for South African Growers.

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- 1. Introduction: Flavor Fall is an interspecie from Zaiger Genetics in the USA. The intellectual property of this variety belongs to SAPO Trust and Fruits Unlimited obtained the exclusive marketing rights from SAPO Trust. This is a very unique plum and will certainly direct our plum industry into a new exciting era. It will now be possible to store plums for much longer periods with normal storage regimes and still maintain a very good eating quality.**

The intention with this concise document is to supply all relevant technical information to existing and potential Flavor Fall growers. This variety has certainly put the plum industry in a new and exciting dimension because of its time of ripening, taste, fruit size, hanging on tree and cold storage ability. More detail will be given below. To be successful in the Flavor Fall production, we have decided to provide maximum technical assistance to all growers and this

will include regular farm visits. This will ensure that mistakes will be minimized and all parties will benefit and share in the success of Flavor Fall variety.

2. **Nursery trees:** The ideal is to plant big trees without cutting back after planting. This will only be successful when following a specific protocol. Later more about this. Trees must be ordered well in advance so that nurseries can plan their rootstocks and storage of winter buds.

3. **Rootstocks:** The most successful rootstock so far is SAPO 778. Even in higher pH soils in Oudtshoorn it outperformed Marianna by far. This soil is high in clay as well (>12%). Flordagaurd rootstock has not been tested commercially but should do well in more sandy soils that are well drained. Viking could also work but once again we don't have lots of experience of this. Marianna/Maridon can be used but this will only be in very fertile soils where clay content is more than 15%. Cadaman was also used but this rootstock is very sensitive for water logging and care should be taken when this rootstock is chosen. Even in the nursery, Cadaman gave problems when exposed to too much water in winter.

4. **Chilling requirement:** It is a normal practice to determine chilling requirement through full bloom date. Other factors are also taken in consideration such as duration of blossom, evenness as well as number of flower buds in warmer areas. We are confident that the chilling requirement is less than that of Songold, Laetitia, Flavor King and Lady Red.

5. **Planting distances:** This is normally a personal choice but we must realize that the wider the plantings the longer it takes to come into full production. We are also not growing any secondary scaffolds anymore so the rows can be spaced much closer. Our recommendation is 3.5m x 1.5 although there are orchards spaced at 3 m apart as well.

6. **Trellis system:** This is also in a way a personal choice but I feel very strongly that we should as far as possible stick to a palmet system with as many wires as possible. Wires should be 25cm apart to create more bearing surface. Trail plantings can also be done to evaluate other systems like Tatura, adapted palmet, free standing central leader and closed vase.

7. **Growth habit and vigour:** The tree grows more vigorous than Laetitia almost the same as Songold but is not as spreading as Songold. It is a much stronger grower than Flavor King. To summarize it will be fair to say it is Songold tree vigour with Laetitia growth habit. It is important to let trees grow as fast as possible during the first year but at the same time the hardening of process will be very important to get proper fruit set the following spring. Too vigorous growth will postpone fruit set.

8. **Pruning:** Most pruning must be done in summer but it must be limited to the removing of very strong uprights only. These must preferably be stopped at an early stage before they get too strong. Very little to no winter pruning must be done to allow the tree to achieve maximum fruit set. Regular visits will assist growers in all pruning practices.

9. **Pest & Disease susceptibility:** We have seen very little stem cancers in some areas and most areas it was not visible at all so this should not pose any threats. It is always a good practice to avoid any form of stress. Replanting and very poor soils can be regarded as two of the most severe stress conditions. The correct rootstock choice is crucial for the successful production of any stone fruit but even more so in plums. We have noticed susceptibility to Red Spider mite where orchards are exposed to excessive dust next to roads.

10. **Cross pollination: This is the most crucial part of the success of Flavor Fall production.** - During certain years it would appear as if we can get away with less pollination. We don't fully understand this but can only think that the weather plays a mayor part here. During most other years however we have noticed that most plum varieties require a lot of pollinators to set economic crops. We can therefore not take any changes so the recommendations are to use as many as possible pollinators of four different varieties. These are **Souvenir, Fortune, Ruby Red and Sun Kiss**. Although we found that Laetitia and Flavor King will also make a contribution, they start flowering a little later. **Golden Kiss** will also be a good pollinator and is regarded as a very good yellow plum with very good fruit firmness and sugars. The fruit size is not as good as that of Sun Kiss. Angeleno also flowers more or less at the same time but is not regarded as a very good pollinator.

11. **Harvest Maturity:** Growers have often made the mistake to start harvesting too early. The sugars will be high early on in the season (mid March) as well as good fruit colour. The fruit should normally not be harvested before the pressures are below 8.5 kg with the 11 mm probe. Brix should be above 18 in most areas. In some areas like Grabouw it could be lower (15). The interesting and most amazing characteristic of Flavor Fall is its ability to hang on the tree almost into May. We have seen the pressures drop gradually to between 6 and 8 and then stay there for 3-4 weeks on the tree without any or very slight drop in pressure. The fruit colour gets better and the flesh colour changes from green to yellow. We have decided to create a release date per area for harvesting Flavor Fall on an annually basis. This will be monitored by the technical team. During the past season the fruit was still within pressure spec by the end of April.

12. **Handling & Packing:** The fruit is sensitive to rub marks but it was not visible on all farms and pack houses. It was also not more visible during handling in heat. By the time it is harvested (April) the weather is cool and any heat should not be expected. Fruit should be packed in grape bags to prevent any change of shrivel. We are currently conducting storage trials in different lifespan and MA (modified atmosphere) bags as well as grape bags. We will be communicating these results during August as we will get the last fruit out of storage at the end of July.

13. **Fruit Characteristics:** Fruit is dark red/purple with a slight green background colour which either changes to yellow or mostly disappears as the fruit colors to 100% dark red/purple. Some broken stones occurred but this was more visible the longer the fruit stayed on the tree. It is also only a piece at the apex side of the pip that broke off and it is not the same as other plums where a bigger part of the pip brakes off. There is also a small cavity inside on the apex side. The fruit shape is slightly oblong and some even has a slight point shape. See photo.

14. **Fruit eating quality:** The fruit has a high acid before harvesting but as it becomes riper, the acid drops rapidly to almost no acid and eventually the fruit can be eaten from the tree. The fruit is crunchy and juicy but becomes softer but still firm after storage.

15. **Production and fruit size:** Flavor Fall has the potential of easily producing a crop of between 40 and 50 tons per ha due to its fruit size. Under certain ideal conditions (good production practices) it should go up to 60 tons/ha. The fruit size of existing Flavor Fall orchards in Ceres produced 22 tons/ ha in 4 th year. Percentage fruit size spread is given in the table below:

B	A	AA	AAA	AAAA
2	15	45	30	8

16. **Marketing:** As previously mentioned we are certain that Flavor Fall will put plum marketing in a new dimension as we will have fruit available until July. This will create huge opportunities on the local market as well as overseas. This might mean that plum imports will only start from August onwards. Flavor Fall could also start an era where we will be able to supply the overseas markets with good size and eating fruit halfway into the Northern Hemisphere season. Their small and poor eating fruit will not be able to compete with varieties like Flavor Fall. The local market has a huge potential for this type of plum.

17. **Cold storage potential:** Fruit can easily store for 42 days at normal plum regimes like Pd7. We have also tested Pd 9 and 12 and both delivered very good storage results. The riper the fruit the lower the Pd. We have done some trails with riper fruit (5-6kg) at Pd 1 and this also worked well. We still have lots of fruit in storage at different regimes and MA bags. We are still getting fruit out of storage on a weekly basis and every new week it shows even more potential. We will store the fruit until at least end of July but expect it to even last longer than that. The reason for the good storage might be contributed to the high acid content during harvesting, as well as inherent fruit firmness-This is also the reason for hanging on the tree for so long. This acid drops to lower levels during storage or if fruit are left on the tree for longer. The eating quality does not show any decline during storage so far. (42 days). We are still evaluating the longer regimes.

18. **Competition for Flavor Fall:** September Yummy ripens more or less the same time and is a club variety with limited planting options due to its higher chilling requirement.

19. Summary and potential of this variety: Flavor Fall is overall one of the most exciting and promising varieties that I have ever worked with. No variety is perfect but I believe if growers follow this protocol there should be no reason why it should not become one of the most successful stone fruit varieties in its time. My feeling is that our industry can easily plant around 500 ha of this variety with the possibility to even extend it to 800 ha. If the MA bag storage is successful, it could even be extended to 1000 ha. This might be a bold statement but I think during these trailing times we need bold people. We have gathered a lot of information during the past 3 years and will continue our quest to supply growers with the best possible research and technical information on a continual basis. Tree orders can be placed with Fruits Unlimited in Paarl or SAPO Trust in Stellenbosch.