

Australian Citrus Study Tour May 2015



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On 17th of April, 2015 the group of 19 people (15 Men + 4 women) started journey from Pakistan, which included some research officers, growers, nursery women, nursery men and couple of graduate students, Reached to Melbourne Australia on 18th of April, 2015.

Stayed at Melbourne and travelled to Mildura on next day (19th April, 2015).

20-04-2015 (Monday)

NSW DPI:

Reached to Dareton station and sanitized our shoes before entering into the station. Dr. Tahir Khurshid & Mr. Steven Falivene introduced about the whole training programme and also about the research station.

Inspection of research trials at Dareton/ Training

Rootstock Trial: Dr. Tahir Khurshid briefed about the different types of rootstocks and their impact on plant growth at Dareton Research Station. He also showed us the rootstock plants, which were under trial study and he is working on them. He told us about Root stock Work & arboretum.

Germplasm Trial: Troy Witte briefed about the different variety of Germplasm, their origin, response to different rootstocks and quality at Dareton. He told us about new varieties on which the research was going on (Navelina, Eureka Lemons and Imperial mandarin). Troy explained about the reworking and showed some plant on which reworking was performed recently. We tasted some variety (Cara cara, Navelina, Washington Navel). We saw some other fruit plants also.

Irrigation Management Training: Later on Jeremy Giddings gave the Irrigation Training. Mr. Jeremy Giddings told us about irrigation timing for summer and winter then and delivered his lecture regarding irrigation practices and tensiometer use. He demonstrated the procedure to plaid the efficacy of Drip irrigation system by checking the volume of water coming through drip, pressure of drip line and pressure of main pump. Cleaning of Drip system was also carried out. Drip system was cleaned from main outlet and also from each drip line. Pressure and volume of sprinkler irrigation system was also checked out. At the end Jeremy explained about the flume data processing.

21-04-2015 (Tuesday)

Mildura Fruit Company (MFC)

This company exports 80% of the citrus fruit, which is about 60% of total Citrus export from Australia, while in Pakistan its only 10-12%. Before 15-20 year ago growers started together as a cooperative farming to help each other for the betterment of their citrus industry. With the passage of time this cooperative System became an important part of the Citrus industry. In Australia Farmers are considered as clients, there is strong Relationship among farmer and packing shed. Farmers produce good quality for the packing sheds and as a reward packing sheds pay profit to growers. There is involvement of professional approach among the growers and packing shed, they work for each other, while in Pakistan there is no too much participation, investing and recognizing value of growers. Both work separately even if farmer produces good quality he would not receive profit.

The sanitation program of packing house was really unique. It was according to quarantine laws and international policy of export. While, in Pakistan the system is not too much sanitized expect fewer thus there is need to follow this practice by Pakistan's citrus industry for better outcomes in future.

Export required great professional approach throughout the value chain of Citrus. Growers could be able to attain specific knowledge about the requirements of export quality fruit, its outcomes and quality based payment until unless skilled knowledgeable professionals and packing sheds will not

perform their duties. There is need of advisory services in Pakistan as being carried out by MFC. Their 02 experts visit 120 orchards/ Growers in a year and they continue remain in touch with them. They provide them each and every information on orchard management for better quality fruit. Packing house provides technical advices & financial support to grower's friendly, while in Pakistan here is gap among both which need to be covered for better results.

Prior to harvest the internal quality of fruit is checked at laboratory for maturity standards. On the basis of the laboratory analysis, the harvesting dates are decided. Degreening practice is adopted in the case, when the fruit get harvested 2-3 weeks earlier than the usual time of harvest. For this practice ethylene is used, so fruit skin colour could be changed earlier. Harvesting is normally done on demand / quota basis, only those amount of fruit is harvested in a d-ay, which could be processed/ packed easily in a day. Because extra fruit reduces its quality and could not be exported further. While in Pakistan large number of fruit get damaged due to this faulty practice. Fruit bins are drenched with the Fungicide within 24 hours of harvest, soon after reaching to the packing shed. (Common in Pakistan too but timing is different; but the practice here in Australia is really beneficial).

During processing at packing shed the quality of fruit is assessed from several directions and many time so that fruit could be clear from every aspect for export. Mechanically quality of fruit is assessed by taking 16 photos per fruit. This thing completely reduces the option of bad quality fruit in the consignment. This mechanical work not only reduced the labour charges, reduces time but also increased the accuracy in work. While, in Pakistan quality is assessed manually by un-skilled/ un-trained labour, which increases the chances of bad quality fruit in the consignment. Mechanized way or skilled labour could be beneficial in this aspect.

Post-harvest losses are observed to be very low on crop harvest, shipping & Packing due to mechanized and timely laboratory work. During packing fruit is packed and fix up in the cartoons mechanically rather than with hands which cause certain damage to the fruits. While, in Pakistan post-harvest losses are little more than here, which need to be addressed wisely by following the good practices.



Washing & Cleaning of fruit

Grading of fruit according to quality

Marketing/ Payment system plays an important role in the success of any industry and also to increase the value of any commodity. In Australia growers are paid on the basis of quality/ Count Boxes. That how much A, B & C grades they are producing. They receive payment according to the grades of their commodity, which pushes them to produce more good quality for better profit and income. In other words Grower rewarded for work to produce quality. Packing House Depend on growers but opposite In Pakistan. They pay more and invest more on growers, they have pretty well organized way of payment.

- 1st Payment within 07 days= 15%
- 2nd Payment = 20%
- 3rd Payment = 35%
- Total in first 30 Days = 70 %
- Rest in Next 2 months = 30 %

While in Pakistan the process of payment is similar to this but last payment usually remained missing because packing sheds and contractors try their best that last amount would not be given to the farmers. In Pakistan 01 quarter of whole amount is given at the time of auction or dealing, 01 quarter of total again at the start of harvest and then 01 quarter by the middle of harvest and last quarter is being given by the end of harvest but this last payment creates a lot of problems for farmers. Farmers remain in search of packing Sheds but they make lame excuses. 02nd in Pakistan the payment is done very little on the basis of quality grades. Most of the orchards get auctioned overall. Thus there is need to investigate the best quality payment system in Pakistan following the strategies of Australian orange Industry. Packing/ Processing houses are the main bridge for export and better quality but in Punjab-Pakistan Some bigger Kinnow packing houses develop monopoly for their benefits, while in KPK-Pakistan orange industry is really striving for the facilities of processors, skilled extension staff and export market.



Seven Field Visit

We visited seven fields, where we observed

1. Raised bed (permanent)
2. Citrus under netting to improve fruit quality by preventing insect pests and also wind blemish.
3. Crows problem
4. High density plantation/spacing decreases to increase number of plants/ acre. Which enhances the production as well.
5. Mini dams/ water reservoir (Dam) for furrows irrigation by growers for summer
6. Produce 80% A grade fruit
7. Regular application of Micro nutrient on the basis of leaf analysis

22-04-2015 (Wednesday)

Seven Fields (Chris Jorge Orchard)

Chris Jorge showed his orchard and shared the practices which he has adopted to produce good quality Crop.

Normally hot/ extreme weather effect the fruit, leaves and tree a lot. Sometimes fruit splits up due to the more intensity of heat and tree also looks less healthy. He shared his experience that how this effect of extreme weather can be reduced. The use of Kaolin clay can reduce the intensity of heat and reflects the light by providing the protective covering to the tree. It's not the clay, which protects the plant. It's basically the biological mixture which minimize the light intensity and reflects it. As a result of fruit dos not split in to two parts and also tress looks green and healthy. In Pakistan due to more extreme warm summer this problem is very common, thus it could easily be overcome by adopting such kind of practice to achieve better quality fruit with healthy tree.



Chris Jorge Explaining about Management practices

Continuous application of fertilizer is very important for proper growth and health of the tree. Even in summer trees have a need of fertilizer. While, in Pakistan its common that in summer there should be no application of the fertilizers because the temperature, which is already high will really effect the tree along with the application of fertilizer in this extreme weather. In spite, of this most of orchards in Pakistan are not too much healthy. But in Australia each and every farmer apply continuous fertilizer throughout the year. Which not only increases his fruit quality but also increases his profit. Thus Pakistani farmers has to think about it carefully, if they want to see their orchards healthy with long life. If orchard required more water in summer than why not food (fertilizer). There is need to change the practices for the betterment.

In Pakistan there is trend set that apply only micronutrients twice in a year without any leaf analysis. But it is highly learned by visiting the orchard that the application of both micro and macro nutrient is important side by side. Thee need is dependent of regular leaf analysis. Because leaf analysis will show that how much plant is depriving off. Continuous application of micro & macro nutrient is very important for green healthy trees and good quality fruit. Because it's the food of tree, which provides energy o the plants. Regular Leaf analysis will help in making complete nutritional plan of the tree otherwise rough application without any estimation will really harm the trees as in Pakistan there is no regular leaf testing and trees are dying in spite of nutrients application.

Control of insects and pests through biological agents is very common in Australia, which not only increase the health benefits by reducing the spray application but also increases the fruit quality without harming the environment. While, in Pakistan there is a judicious use of Chemical (Insecticides & Pesticides) without any proper recommendations, which is not only harming quality but health as well. Thus there is need to investigate best ways for biological control.

Here it was observed that the problem of incompatibility among the stock and scion was solved by using inter stock through reworking/ top working technique. Valencia is being used most commonly as inter stock. This technique not only help to solve the issue of incompatibility but also help to change the desired cultivar, which is ready to produce early fruit. While, in Pakistan if there is incompatibility then farmers even researchers think to uproot the plant and have no concept to change the desired cultivar within shorter period of time. Thus there is plenty of cushion to adopt this practice or technology in Pakistan to strengthen the citrus industry in Pakistan.

Pruning is most common crop management practice, which is carried out on regular basis in citrus groves of Australia. Precise and accurate way of pruning in this grove showed that how this technical practice impact the fruit quality & size, which ultimately increases the profit/ income as well. Precise way of pruning includes skirting, Open Window and pruning from inside the tree. This is accurate way of pruning, which enhances the quality. While, in Pakistan pruning has different meanings. Farmers are reluctant to prune every year. Here farmers and researchers observed by themselves that how pruning really effects the quality and size of fruit. There is need to follow similar pattern in Pakistan in order to boost up the citrus industry in Pakistan. Keeping in view the importance of pruning, the pruning training was also given by Mr. Steven at Dareton Research station and later on practiced by Pakistani group as



well.



VCF (Jason Bowes Nursery)

On 23rd of April we visited the VCF nursery. There we saw that they crush concrete on the ground. Tubes were present on the crush flour, they do not use the chip budding. There are gaps, which need to be covered in Pakistan. Which were learnt at VCF nursery

Nursery was highly Hygienic having proper Foot bath.

Useful & Proper Media Coconut Coir+ Vermiculate+Fertilizer Bark was observed, While in Pakistan there is use of soil, sand & silt, now there is little use of Bagasse as well, which is performing very nicely in Pakistan. Thus there is need to alter media

Media standardization is required as VCF.

Single stem/ Stacking was practiced and need to be adopted in Pakistan for good shaped plants and later on tree.

Fans & Heat Chamber were observed to control the fungal issues in the nursery, while in Pakistan nurseries have many fungal issues thus need to launch this practice in Pakistan

Containerized/ shed house nurseries were observed, there is need to work on it in Pakistan.

9-10” Height of budding was observed in all places, while in Pakistan budding is usually done at lower places which cause problems thus need to alter the practice.

Certification and proper criteria for nursery growing was observed in Australian Nurseries. There is need to adopt this way in Pakistan and policy should to be made.

Color Categorization for pots on the basis of marketing & Different sizes of pots on the basis of age of plants was observed and need to be adopted in Pakistan. (1 Litre pots: Small & 04 Litre Pot: Large)

Fertilizer application was observed on regular basis after every 7-10 days, which need to be adopted in Pakistan as well.

We also saw some other varieties of avocado & mango.

23-04-2015 (Thursday)

Pruning Training at Dareton

Mr. Steven told us about Pruning, Why pruning is important for plants? Pruning is very important for plant as it provides Space for the Fruit, no blemishing occur on fruit.



Pruning Practice by Participants

Nursery People Visit (Grain Jolly)

On 23rd of April Nursery women also visited the grand Jolly's nursery. They observed certain differences, which are required to be adopted in Pakistan.

1. 70ml daily irrigation to nursery plants, 320ml in extreme weather. There is need to be adopted in Pakistan
2. Foliar application of fertilizer after 21 days (NPK) was carried out & there is need to adopt it in Pakistan
3. Grading & Registration of Nurseries was observed in Australia. Thus it's necessary to categorize the nurseries, make policy + criteria for nurseries in Pakistan.
4. Chip budding new practice observed in Australia Nurseries, It could really be very useful & need to be adopted In Pakistan.

Seven Fields Tarcoola Orchard (Manager: Daren)

Visited the seven fields at Tarcoola and observed

1. Fertigation system was observed on regular basis
2. Oil Spray was carried out to protect the certain insects.
3. Pollinizers were used to avoid cross pollination among Afoura and Imperial mandarins otherwise Afoura will produce seeds as well. Due to sterile pollens of Afoura it is seedless.

24-04-2015 (Friday)

OLAM International Limited

Visited the OLAM International Limited; an almond processing factory. Mr. Zubair told us about harvesting technique. Orchard manager showed us orchards and briefed us about the management practices in the almond orchards. We saw the video about the whole processing taking place at Olam. We visited the processing Unit as well.

Sun Mar Orchard

Visited Sun Mar orchard and observed

1. Fertigation System in the Orchard having NPK+Acid 71%+Calcium Iron, There is Need To follow in Pakistan
2. Drainage System was observed at the orchard. Flood irrigation is Common in Pakistan (Need to change/ resource dependent)
3. Micronutrients application was Continuous with Every Irrigation, there is need to change the nutrient schedule in Pakistan.
4. Cover Trunk/ Insulator was good practice, observed at the orchard site to protect from diseases and weedicides. Really good to adopt in Pakistan.
5. Zig Zag Plantation was observed, which was good practice, but not too much useful in Pakistan. It can be adopted according to resources and management.

25-04-2015 (Saturday)

Travel to Sydney

Stayed at Travel Lodge, Wynyard, 7-9 York Street, Sydney

26-04-2015 (Sunday)

Visit of Sydney Wharf Systems

27-04-2015 (Monday)

Travel to Bundaberg

Stayed at Kacey's Bagara Beach Motel, Bundaberg

28-04-2015 (Tuesday)

Bevan Young & Ken Harris Orchard

We visited the citrus orchards where Bevan young and Ken Harris told us about crop management practices, use of root stock & Valencia as inter stock. He told the use of Valencia's as interstock proved better results. They told us about the pruning, which they usually perform every year to remove the dead woods and dry woods cost of pruning is 1-2 dollar/ tree every year. The pruning & thinning is done every year. Thinning improve the quality of fruit with less Blemish and disease. It also controls the alternate bearing of fruit in marcott. They apply fertilizer at three time in the form of ammonium nitrate after harvest. For Fungal problems the spray Copper based fungicide. Humidity, Rainfall & Dew is more problem at the stage of 30% petal fall. For harvesting use Gloves and clippers. Ladders don't squash the trees. Small clipper, not damage the fruit short stem and never damage the fruit. Picking bag was small and easy to unload the fruit. In Pak put karate on one another so that it is easy to unload the fruits. During summer, they irrigate once a week or twice if hotter.

Alan Jenkins Orchard

Allen and Susan Started this orchard in 1990 having 120 hectors, Harvest 9-12 Thousand bins and Export about 4-5 thousand per year. All fruit exported to other countries Turkey, Jakarta, Middle East, Iran & Indonesia. Marcott is major variety along with Freemont, sun burst & Nova variety but not popular because lake of colour. Thinning is done with 2,4-D and thin maximum to reduce crop load they use a 0.5 cm³ square frame to measure the crop load of Freemont and thin if above 11 fruit per frame. Thinning and pruning cost about 2-3 dollar per tree. Thinning removes blemished, Diseased, small and clustered fruit having less quality. Major Disease problem was black spot but Fremont was resistant with 1-2 spray of cooper. Some fruit were damaged by sun burn. Thinning program is similar in Freemont but not the use of 2, 4-D. Government officer checks all Export Fruit for pest and disease issues. He checks mainly the Insect problem red scale. Other is Mealy bug, 1 consultant had 31 growers, to monitor/ check 10 trees and 100 fruit per hector for insect and then make recommendations.

29-04-2015 (Wednesday)

Bugs for Bug

We went to company of bugs for bug. Dr. Dan Papcic was working from 37 years. He started with citrus but now working for other crops as well due to more popularity of biological control. He was using biological control by using leaves he used pumpkin for the raring of lady bird beetle. This was last day of our work.

30-04-2015 (Thursday)

Travel to Sydney

Stayed Travel Lodge, Wynyard, 7-9 York Street, Sydney

1-5-2015 (Friday)

Sydney-Bangkok

27-04-2015 (Monday)

Bangkok-Islamabad Pakistan

TOUR GLIMPSES



Visit to MFC



Visit to Seven Fields





Visit to VCF



Visit to Sun Mar Orchard



