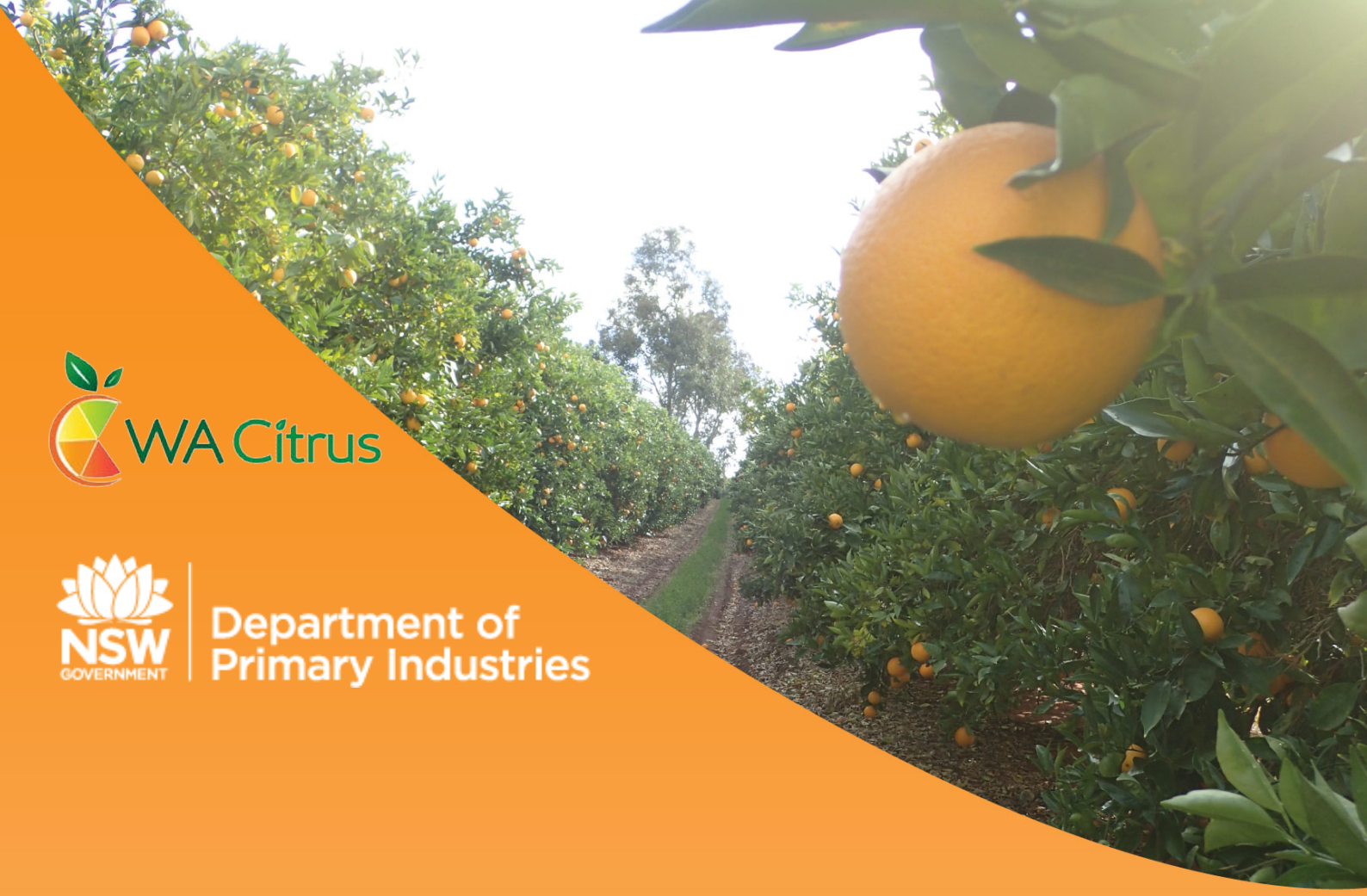

WA Citrus

NSW GOVERNMENT | Department of Primary Industries

Citrus R&D roadshow

Tuesday 12th September 2017
9:30am – 4pm, Novotel Vines resort, Swan Valley

Quality science for a prosperous citrus industry

2017 Citrus R&D roadshow

Novotel Vines resort, Swan Valley, Tuesday 12th September 2017

Version 7-9-17

Session 1	**Varieties & rootstocks**	
9:00 am	Registration	
9:30 am	Welcoming address	WA Citrus
9:35 am	NSW DPI update	Myles Parker NSW DPI
9:40 am	New Chinese rootstocks & trial update	Tahir Khurshid NSW DPI
9:55 am	Rootstock compatibility	Graeme Sanderson NSW DPI
10:10 am	New variety highlights & challenges of reworking	Kevin Lacey DPIRD & Graeme Sanderson NSW DPI
10:30 am	**Session 1 discussion & questions**	
10:40 am	**Tea break & variety tasting**	
Session 2	**Insects & diseases**	
11:00 am	Local & exotic disease – Phytophthora, Black core rot & exotics	Nerida Donovan NSW DPI
11:30 am	Insects - back to basics: Red scale & citrus gall wasp	Jianhua Mo NSW DPI
12:00 pm	Accessing export markets: FRW integrated control	Steven Falivene NSW DPI
12:20 pm	**Session 2 discussion & questions**	
12:30 pm	**Lunch**	
Session 3	**Weeds & plant growth regulators**	
1:15 pm	Control options for fleabane, feathertop and ryegrass	Malcom Jones Syngenta
1:35 pm	Plant growth regulators (GA for fruit set & 24D for navel end)	Steven Falivene NSW DPI
1:50 pm	Plant growth regulators (GA for rind quality)	Imre Toth Sumitomo
2:05 pm	Plant growth regulators (Tops)	Ramsay Zreikat Campbell Chemicals
2:20 pm	Regrowth management & rind texture project: factors and results	Andrew Creek NSW DPI
2:40 pm	**Session 3 discussion & questions**	
2:50 pm	**Afternoon tea**	
Session 4	**Fruit quality**	
3:10 pm	Economics: Seedless vs netted vs isolated & windbreaks	Bronwyn Walsh WA Citrus & Steven Falivene NSW DPI
3:50 pm	China fruit quality preferences & deficit irrigation effect on sugar and acid	Andrew Creek & Steven Falivene NSW DPI
4:10 pm	**Session 4 discussion & questions**	
4:20 pm	Closing remarks	WA Citrus
4:30 pm	End NOTE: Field session on Wed 13th (see next page)	
		Program may be subject to change

Field trip: bus tour

Bus departure: 7:50am, Wednesday 13 September 2017, Vines Resort, Swan Valley

Return: 4:00pm, Vines Resort, Swan Valley

Where: Northern citrus production region, WA

The major northern citrus production region of WA includes the coastal sandy soils of West Gingin, loamy soils of Bindoon and sandy loam of the West Midlands. It covers an area upt to 250km north of Perth. Mandarins, navels, grapefruit and lemons are grown in the region. Two of WA's largest citrus orchards are located in the region as well as the growers from the newly formed Western Citrus Alliance. We will be visiting Moora Citrus orchard and the AgriFresh packshed.

Lunch: Hosted by Moora Citrus

Registration

Cost: The event is **free** thanks to funding support from NSW DPI, WA Citrus, and our sponsors: Campbell Chemicals, Sumitomo chemicals and Elders.

Thanks also to Citrus Australia for their support. Horticulture Innovation Australia is acknowledged for their investment in projects presented at the roadshow.

Thanks to Moora Citrus and AgriFresh for hosting the field trip site visits.

Registration is essential by Friday 8th September for catering and event organising purposes. Registering early is appreciated and ensures your place at the roadshow and field trip.

Please register your attendance by clicking here.

For further details or queries please contact WA Citrus Administration Officer Kate Cox:
0439 899 600 or admin@wacitrus.com.au.

2017 WA citrus R&D roadshow

Vines resort, Swan Valley, 12 September

"Take home messages"

Session 1	
NSW DPI update	● Harvest handbook to help train pickers on NSW DPI website ● NSW Plant protection and management guide published. Download available by October 2017 ● Due Oct.- Dec. 2017 on NSW DPI website ○ Mandarin manual ○ Updated variety factsheets ○ Citrus economics handbook and custom sheet downloads ○ Citrus phone App ● Obtain updates from CitrusConnect e-newsletter. Email steven.falivene@dpi.nsw.gov.au to subscribe.
New Chinese rootstocks for improved productivity & fruit quality	• Six new Chinese rootstocks are available from AusCitrus. • Many have attributes superior to Australian rootstocks that can provide higher productivity and fruit quality is certain situations. • Full details of rootstock attributes is available from the rootstock section of NSW DPI citrus website.
Rootstock compatibility	● Compatibility issues can be very specific to both scion varieties and rootstock types. ● Incompatibility can be obvious as early as 3 years of age after planting or later at 8-12 years or more. ● New rootstocks need to be assessed under Australian climatic and soil conditions as well as scion varieties before recommendations can be provided to citrus growers.
Variety highlights	● The importance of China as an export market for Australian fruit has resulted in several local citrus selections being targeted for an increase in plantings. ● The export demand for red fleshed citrus selections such as Cara Cara navel is continuing to expand. ● Natural mutation of citrus leading to the development of new varieties is a common trend in Australia and is creating international interest.
Challenges of reworking	● Prior to reworking a full site assessment should be done to determine previous, herbicide use, age of trees, rootstock and general health status of the trees. ● Reworking factsheet available from NSW DPI website ● Reworking video upon request (loaded NSW DPI website by Dec 2017)
Session 2	
Local & exotic diseases	● If possible, before sending a sample to a diagnostic lab, speak to the diagnostic plant pathologist, send photos, and find out what sort of sample is best to send and how to send it. ● It is important to realise that the isolation of an organism from your diagnostic sample, does not mean that is the primary cause of the problem. The organism could be a secondary invader. ● It is important to know what is in your budwood. Only use budwood and rootstock seed from a tested source, such as from Auscitrus. There is no cure for graft-transmissible diseases. It's not worth the risk. ● The biggest exotic threat to the Australian citrus industry is huanglongbing (HLB) carried by the Asian citrus psyllid. But there are other devastating diseases that we need to keep an eye out for. If you see suspicious symptoms, contact the Exotic Plant Pest Hotline on 1800 084 881 to speak to someone who can help.

Citrus Gall wasp: update on control trials and grower experience	• Research update: **Only Samurai is registered by permit to control Citrus gall wasp. Other products are registered for other pests in citrus. You must follow label recommendations.** • Surround™ deters CGW egg-lay. It can reduce galling next season by 90%. It is more costly than chemical insecticides and might increase red scale populations. • Samurai™ and Confidor Guard™ applied in late spring are effective for CGW control in navel trees. As much as a 95% reduction of galls has been observed. In severely infested blocks and/or large trees the reduction rate might be lower (i.e. 50%). • Movento™ can provide good control in Valencia trees when applied during February and April. It kills the larvae and reduces the number of adult gall wasps emerging from galls next spring. • Parasitic wasps have established in the southern regions, however, current numbers are insufficient to offer satisfactory control of CGW. A small block with over 12 years of parasitic wasp establishment has had a significant reduction of galls, although it has not eliminated the wasp.
Red scale : target lifecycles and management options	● Biological control is the key to successful red scale management. Avoid using broad-spectrum insecticides wherever possible. ● Red scale populations are patchy. There is usually no need to spray the whole orchard. ● The best timing for oil/contact insecticides is to target the crawler and the white cap stage. Oils have limited effect on mature scales. Insect growth regulator (IGR) insecticides are also more effective against young scale. ● First post-winter peak of crawlers occurs between late October and mid-November in the southern citrus regions. Later peaks are less distinct due to overlapping of different red scale stages.
Accessing export markets: Fullers rose weevil integrated control	● Commitment to monitoring and implementing control strategies is essential. ● Single and dual side trunk band spray (TBS) machines; see NSW DPI videos on website. ● TBS can cause secondary pests: mites, redscale & mealybug. Monitor and probably need intervention of oil and/or chemical control. ● Exirel is a new foliar spray option. Block trials by Dupont indicate a potential to replace some or all TBS. More field work and experience required to better understand responses (control and beneficial insect impact) in various situations.
Rind texture project: factors and results	• Controlled research trials definitively demonstrated that high levels of nitrogen and somewhat potassium increases rind coarseness. • Comparison of blocks across regions and within regions was unable to find an association between level of nutrient application, leaf analysis and rind texture. • Suggest that other factors such as navel budline, tree age and crop load can greatly impact navel rind coarseness. However continue to manipulate crop load and nutrition to suit your circumstances. • When replanting ensure trees were propagated from a known budline of high health status wood.
Session 3	
Control options for fleabane, feathertop and ryegrass	● Fleabane, feather top and ryegrass have become tolerant to some common knockdown herbicides. ● Control of these weeds is possible but specific strategies are required. In general most are best controlled at the young growth stages, therefore monitoring weeds emergence is important. ● Specific strategies and general weed management procedures are outlined in the weed management chapter of the NSW Citrus Plant Protection guide.
Plant growth regulators: navel end reduction & increase fruit set	• G.A. at 90% petal fall and one week later increased fruit set, but set smaller fruit. Next trials will target an earlier application timing to target bigger fruit. • Auxin at 90% petal fall o Washington Navel - reduced navel end size, increased rind coarseness (naturally coarse rind), increased granulation, less juice and lower acidity. No effects on; yield, fruit size, Brix, navel end split and wind blemish. o Leng navel - reduced navel end size, reduced navel end split, reduced wind blemish by ~ 4%. No effects on; yield fruit size, Brix, acidity and granulation.

G.A. for rind quality	● Applied in Jan (golf ball fruit size, 10-20 ppm) to reduce the incidence of albedo breakdown. Many packing houses make it mandatory for all export fruit. ● Optional colour break (April) 10 ppm spray to delay rind development (spread out harvest). Late navel varieties are sensitive and will require a reduced rate. ● No wetter needed, essential to adjust pH to about 5.0-5.5 . ● See NSW DPI plant protection guide article or Sumitomo brochure for more details.
Tops: fruit thinning and sizing	● Can be used to thin or size fruit. Must monitor the climate and crop during the early stages of fruit set and growth (fruit size and crop load) to identify need and timing. ● Can use on mandarins and oranges. Best to trial small areas first. Once you gain experience with Tops it is a very valuable tool. ● More information: Contact details the advertisement in the NSW DPI Plant protection or Tops web page at, http://www.campbellchemicals.com.au/tops-pgr-citrus-lychees or call Geoff or Ramsay on 02 9725 2544, so we can help you get the best possible result.
Regrowth control on reworked trees: chemical trial results	• Naphthalene acetic acid (NAA) is not registered for citrus in Australia. • Current research is evaluating NAA use when reworking trees. • NAA can reduce the number of suckers. • Efficacy has been variable between sites. • NAA use has been cost neutral compared to de-suckering labour. • Future research will investigate adjuvant use to increase efficacy and reduce cost.
Session 4	
Windbreak economics: when does it pay? & Afourer overhead netting economics	• Need 5-10% increase in 1st grade pack-out for windbreaks to be economically viable • Anecdotal grower feedback suggest windbreaks in partially protected flat topography in Sunraysia provides about a 5% improvement in 1st grade pack-out, however in higher risk areas (exposed paddocks / hillside, windy regions) can be 10-20% or more. No studies are available to validate growers pack-out estimates. • Opportunity to study the effect of windbreaks and other blemish management strategies throughout farms in major regions to provide better guidelines on if/where windbreaks provide benefit and other management strategies. • Afourer economic analysis: growing seedless Afourer in an isolated region is financially similar to growing under overhead nets in a high pollination area. The use of Drape net and seedless private varieties follows very closely behind. Growing fruit with seeds and receiving a 50% decrease in price is uneconomical.
China fruit quality preferences	• Chinese prefer citrus higher in sugar (brix) and lower in acid (sour) than the Australian pallet. • A good tasting piece of fruit has 12° brix and 0.6 % acid. Fruit with less than 11° brix and > 0.8 % acid was not a favourable eating experience for Chinese consumers tested. • Blemish free fruit is important, however some fruit brands that guaranteed a certain B:A ratio were able to sell blemished fruit at a price similar to 1st grade fruit. • Generally wax is not used on domestic citrus, however is accepted on imported fruit. • The oval shape of Newhall navel oranges was not considered a marketing problem.
Deficit irrigation for sweetness: experiences & challenges with navels	● Overseas research demonstrates water stress in late summer to autumn can increase fruit brix and acid. Potential for Australia to improve competitive edge. ● Used in Japan to improve quality of satsuma mandarins (NSW DPI video available) ● NSW DPI Dareton row trials of deficit irrigation (4-6 weeks starting in late Feb / early March) in Washington navels were unable to have an effect on Brix, acid or fruit size. ● In the first year trees missed every second irrigation and in the second year were given half irrigations. Trees were stressed for at least three weeks (leaf wilt). ● Next season trees will be given higher levels of stress (dry weather permitting). ● Growers interested in explore this technology can contact the NSW DPI citrus team.