Grove Management Best Practice



Presented by Peter McFarlane, AOA OliveCare® Administrator

OliveCare® Best Practice Webinar Series: #1 Grove Management Best Practice







OliveCare® Best Practice Webinars

Welcome - this is the first in a series of 3 webinars on the *OliveCare®* Best Practice Program:

Webinar 1: Grove Management Best Practice

Tuesday 15 June 2021 - 12.00 noon (Adelaide time)

- Webinar 2: EVOO & Flavoured Olive Oil Production Best Practice Tuesday
 29 June 2021 12.00 noon (Adelaide time)
- Webinar 3: Table Olives / Olive Paste Production Best Practice Tuesday 13 July 2021 - 12.00 noon (Adelaide time)

A copy of these webinar presentations will be made available to participants. Each webinar will guide participants through a <u>selection</u> of the now 180 *OliveCare®* Best Practice Checklist items (Conversations) and introduce other resources that aim to lift grove productivity, achieve product excellence and develop sustainable business practices.







OliveCare® Best Practice Webinars

Through these webinars participants will gain an appreciation of:

- Benefits of membership of the *OliveCare*[®] Best Practice Program;
- Principles of risk management, and identification of major risks to olive product quality;
- Benefits of having a Hazard Analysis Critical Control Points (HACCP) style food quality plan;
- Application of *OliveCare*[®] Best Practice Checklists;
- Requirements of Australian Consumer Law, the FSANZ Food Standards Code, and AOA's olive product labelling guidelines for olive oil, flavoured olive oil and table olives;
- Application of the Australian Standard for olive oil (AS5264-2011), & Voluntary Standard for table olives in Australia (12-111);
- Product testing & other compliance requirements for OliveCare[®] certification of olive products.







MAKEA COMMITMENT TO OLIVE OIL QUALITY

Join the Australian Olive Association's OliveCare® Code of Best Practice





What is *OliveCare*®?

- OliveCare[®] is the AOA's Industry Code of Best Practice Program which provides a systems approach to managing risk and underpins product quality;
- In a high cost producer country such as Australia, it is essential that olive producers are able to compete on product quality rather than just on price;
- Improving grove productivity is also essential in order to reduce the high cost of production;
- OliveCare® establishes a framework that encompasses Good Business Practice (GBP), Good Agricultural Practice (GAP) & Good Manufacturing Practice (GMP), with Hazard Analysis Critical Control Point (HACCP) style production controls;





What is *OliveCare*®?

- OliveCare[®] incorporates provisions of the Australian Standard for Olive Oils and Olive Pomace Oils (AS5264-2011[®]), introduced in July 2011; and the Voluntary Industry Standard for Table Olives in Australia (RIRDC 12-111), introduced in 2012, (there is no flavoured olive oil standard);
- OliveCare[®] fosters a compliance culture within the industry in relation to industry voluntary standards, Australian Consumer Law (ACL), and the Food Standards Australia New Zealand (FSANZ) Food Standards Code;
- The OliveCare® Administrator is appointed by the AOA, reporting to the AOA CEO and is responsible for the day to day operation of the program.







OliveCare® Managing Risk

Olive producers face many kinds of risk that need to be managed :

Productivity: reduced crop load / reduced crop value / high cost of production – resulting in declining enterprise profitability.

Product Quality: downgraded quality / defective products – resulting in loss of consumer demand, confidence and reputational damage.

Food Safety: exceeding pesticide maximum residue levels (MRL's); physical, chemical and biological contamination; product adulteration – requiring product recall.

Biosecurity: incursion of endemic (established), and exotic (not yet here) pests, diseases and weeds – resulting in higher production costs, reduced yields and profitability, or worse!

Environmental: managing waste including processing discharge, adapting to increasing climate variability – resulting in higher production costs, reduced yields and profitability.

Regulatory: employment of illegal workers, unsafe workplaces - resulting in prosecution and reputational damage.

Whilst the *OliveCare®* plan template focusses on managing risks to **Product Quality, Food Safety** and **Productivity**; other risk factors can be readily integrated into the plan.







OliveCare® Managing Risk

Risk Assurance Templates:

The following Risk Assurance templates enable a small scale olive producer to provide a statement of risk assurance to the AOA, to the effect that the EVOO or table olives they produce are safe to consume, and that the production processes preserve the quality of the olives.

These templates are intended to meet the <u>minimum</u> requirements of the AOA *OliveCare*[®] Code of Best Practice, and can be downloaded from the AOA website:

- <u>OliveCare[®] Risk Assurance Template Safety and Quality Small</u> <u>Grower Version – EVOO</u>
- OliveCare[®] Risk Assurance Template Safety and Quality Small Grower Version – Table Olives







OliveCare[®] HACCP Style Food Quality Plans:

The most widely accepted Food Safety System in the world is based on principles developed in the 1960s, known as **HACCP (Hazard Analysis Critical Control Points**).

OliveCare[®] has prepared two comprehensive HACCP Style Food Quality Plan templates for Australian olive products, that are available for download from the OliveCare[®] Members Page on the AOA website:

- Extra Virgin Olive Oil (EVOO) & flavoured olive oil
- <u>Table olives and olive paste</u>

Both templates cover the complete supply chain and have a focus on product quality, meeting the needs of olive growers / processors / bottlers / distributers, whilst remaining consistent with HACCP food safety system requirements.







In order to comply with *Olivecare*[®] Code of Best Practice certification, it is a requirement that each Signatory have a 'Food Quality Plan' for their enterprise, which may be adapted from the templates provided.

The *OliveCare*[®] Food Quality Plan template is based on the 12 step methodology of HACCP, with one crucial difference - whilst HACCP only concerns itself with food safety and makes no mention of food quality; this simplified 8 step *OliveCare*[®] template is also concerned with product quality and enterprise productivity.

The	e Eight Steps of OliveCare® HACCP		
Step 1 Assemble a team			
Step 2	Describe the product and its use		
Step 3	Define the processes to be used		
Step 4	Construct a flow-chart and confirm the viability of		
	the plan		
Step 5	Conduct a hazard analysis		
Stop 6	Determine Critical Control Points (CCPs) and their		
Step 0	limits		
Stop 7	Establish monitoring systems, verification		
Step 7	procedures and corrective actions		
Step 8	Establish documentation and record keeping		







Picking up the HACCP process at Step 4: Construct a Flow Chart (on-farm including harvesting):









Step 5: Conduct a hazard analysis

The following is a standard HACCP formula to examine each step for potential food safety hazards from chemical, physical or biological contaminants, and environmental hazards.

Various food safety hazard analysis tables have also been developed throughout the templates.

Hazard Analysis Process – on-farm:

For each step in your processes, you will need to consider each of the types of hazard identified:







Chemical Hazards (Food Safety & Regulatory Implications):

- A chemical hazard is any substance that can cause illness or injury due to immediate or long-term exposure when contacted, ingested or inhaled.
- Has any persistent chemical been previously used on the grove?
 IF YES: Send a sample for testing for organochloride / organophosphate residues.
 IF NO: There is no significant risk.
- Each and every chemical application needs to be recorded in a "Spray Record Diary" or computer spreadsheet. Check to ensure all applications are of approved chemicals and that withholding periods have been adhered to.
- Consider occupational health and safety of workers, ensure workers are trained to handle chemicals (or hire qualified contractors).
- Safely store chemicals away from foodstuffs & packaging (you must have a lockable chemical storage area).
- Use only food grade inputs, and use only approved chemicals for cleaning & sanitizing.







Chemical Hazards (Food Quality Implications):

- Use of old / non-food grade plastics fittings has potential to contaminate olive oil products with plasticisers (phthalates) which are of concern to consumers and can compromise access to some markets eg China, EU.
- Use an equipment maintenance checklist to reduce risk of machinery breakdown and associated product contamination.

Physical Hazards (Food Safety Implications):

- Presence of foreign bodies in finished product can lead to product recall notices, and reputational damage – clean up the grove and processing facilities.
- Sources of foreign matter:
 - Accidental situations, poorly maintained facilities;
 - $\circ~$ poorly managed procedures.







Physical Hazards (Food Safety) continued:

Physical Contaminant	Source of Contaminant
Glass	Glass fragments - bottles, jars, light fittings, thermometers
Wood	Twigs, pieces of wood from olive orchard
Stones	Olive orchard, olive stones with destoned olives
Metal	Machinery – olive orchard, processing plant
Pests	Insects, rodents
Plastic	Olive orchard
Personal Items	Pens, buttons, jewelry

Slide: Professor Stan Kailis, Australian Mediterranean Olive Research Institute







Physical Hazards (Food Quality Implications):

- Olives in bulk storage will deteriorate with heat (respiration and environmental) - ensure crates and bins of olives are not over filled and are stored in the shade or in a cool room?
- Growers need to ensure that core temperature of the olives (measured at 40cm into the fruit bin) should be < 5°C higher than air temperature with an absolute limit of <10°C higher than air temperature.
- Processing heat affected olives may result production of poorer quality oil with **high Free Fatty Acid (FFA)** and **Winey-Vinegary** organoleptic defects.

Biological Hazards (Food Safety Implications):

- Food allergies are relevant to table olive products.
- Food allergy is when the immune system of a susceptible person reacts to an allergen, usually a protein.
- Symptoms can be mild to life threatening (anaphylaxis within a few seconds)







Biological Hazards (Biosecurity, Regulatory and Productivity Implications)

 Spread of pests and diseases within and between groves due to poor biosecurity practices can result in increased costs and reduced grove productivity – use vehicle wash-down facilities and control movement of visitors.

Environmental Hazards (Food Quality & Productivity Implications):

- Frost, flood, drought and fire impact on grove productivity and can also impact on product quality – monitor and manage these risks where possible.
- Early summer heat events are a major cause of flower drop and reduced fruit set, as well as damage to next seasons fruiting shoots and triggering biennial bearing monitor soil moisture reserves.







OliveCare® Food Safety / Quality Plan

Environmental Hazards (continued):

- Late spring frosts are also a major cause of flower drop and reduced fruit set, as well as damage to next seasons fruiting shoots and triggering biennial bearing – monitor grove temperatures.
- The 'Frosted' defect is characteristic of oils extracted from olives that have been injured by pre-harvest frost. Aromas stewed fruit fresh cut mushrooms wet wood vanillic acid sweet aroma bitterness and pungency tend to disappear and the fruit flavours 'muddle', they are not crisp and clear.
- Responsible disposal of processing waste, use to build soil carbon and increase biological diversity to support sustainable groves.







Step 6 – Determine Critical Control Points (CCPs) Hazard Analysis Methodology:

The level of an identified risk / hazard is based on a combination of the determined **consequence** and **likelihood** of the risk event occurring. The following is an example of a simple **risk level matrix**:

ow						
loderate						
ignificant						
ligh						
			Consequenc	e		
Likelihood	Insignificant	Minor	Moderate	Major	Catastrophic	
	1	2	3	4	5	
Almost Certain	-	10	45	20	05	
5	9	10	15		- 20	
Likely			10			
4	4	0	12		20	
Possible		0	0	40		
3		6	9	12		
Unlikely			-		10	
2	-2	4	0	0	10	
Rare		0		4	-	
1		2	3	4	5	







The following tables list steps in the process outlined in the earlier flow chart. In your plan you will need to list any potential hazards relating to each step, and use the formula for assessing the risk in your particular situation.

The column headings, and how you use them, are detailed below:

L = Likelihood: The team assesses the likelihood that the potential may occur on a scale of 1 (unlikely) to 5 (very likely)

S = Severity: The team assesses the impact of the hazard on food safety or food quality on a scale of 1 (insignificant) to 5 (catastrophic)

R = Risk: Multiply L x S to give a Risk Factor. A Risk Factor of 8 or over is **Significant**; a Risk Factor of 15 or over is **High**.

C = Consequence: Control measures must be applied to all significant or higher risks.

CP = Control Point (action needs to be taken)

CCP = Critical Control Point (tests need to be done to verify that there is no hazard)

QCP = Quality Control Point (potential to impact on product quality)







POTENTIAL HAZARD		s	R	с	CONTROL MEASURE	CP / CCP / QCP
MAJOR STEP: ENSURE THE SOIL IS FREE FROM CONTAMIN	IATIO	NC				
Biological, Chemical: inspect site records to see if any pervious use of the land could be affected by previous chemical use Olive groves planted in soil with previous cotton, potato or brassica plantings may have an increased risk from the soil borne fungus Verticillium wilt (<i>Verticillium dahlia</i>)	1	4	4	м	If there is any suspicion of chemical residues or soil borne pathogenic bacteria or fungi the soil should be tested	ССР
Physical, Quality: no food safety or food quality issues of a physical nature						
MAJOR STEP: ENSURE MRLs and APVMA PERMITS AND W	/ITHH	HOLD	DING	PERI	ODS ARE NOT EXCEEDED	
Biological, Physical, Quality : no food safety or quality hazards						
Chemical : chance of chemical residues on the olives if the sprays have not been applied correctly; chance of chemicals being used that do not have APVMA certification.	1	4	4	м	If there is any suspicion of chemical residues the olives should be tested. Check spray records against AOA or APVMA website information on current registrations	ССР

POTENTIAL HAZARD		S	R	С	CONTROL MEASURE	CP / CCP / QCP
MAJOR STEP: ENSURE PROTOCOLS ARE IN PLACE TO ENSURE QUALITY OF THE OLIVES						
Dod Nutrition Practices: an imbalance of nutrients the soil or on the foliage could affect the cell ructure of the olives, compromising the quality of e fruit, and increasing susceptibility to pests and seases2		3	6	М	Samples of olives should be sent for independent testing (leaf analysis).	QCP
Good Grove Practices : high quality olive oil requires olives that are not contaminated with anthracnose, sooty mould spores or insects	1	4	4	м	Using coloured flagging tape, tag any trees that are not suitable for harvesting	QCP
Good Biosecurity Practices – the presence of quarantinable pests and diseases may seriously disrupt production and marketing	1	4	4	М	Implement good on farm biosecurity practices and grove hygiene, regularly monitor crops and report any unusual pests and disease symptoms	ССР
Good Hygiene Practices: quality of the olives could be affected by the cleanliness of the storage bins.	1	4	4	м	Supervisor to inspect all bins before use and clean any that look dirty	QCP
Good Irrigation Practices: if irrigation is used on an olive grove a good understanding of the growth cycle of the trees will be required to schedule this irrigation. Olives with too high a water content can cause problems at the mill at the point of extraction		4	4	м	Study of the growth habit and rainfall pattern of the specific grove will help with irrigation scheduling	QCP
Good machinery maintenance practices: use of PVC or other (non-food grade) plastic and perished hoses and fittings can contaminate fruit with phthalates compromising export market access.		5	10	S	Implement a machinery maintenance schedule including replacement of perishable or unsuitable fittings	QCP



Step	Hazard	Control Measure	Monitoring Procedures	Critical limits	Corrective Action	Records
Ensure all withholding periods have been observed	Chemical residue on olives	Inspect spray records	<u>What</u> : spray diary <u>How</u> : manual inspection <u>When</u> : prior to harvesting <u>Who</u> : farm owner	FSANZ - Food Standards Code Section 1.4.1	Take samples for testing. Do not harvest olives if there is contamination	6.7 Grower declaration
Ensure all chemicals have approved on-label use or APVMA permits	Chemical residue on olives	Check chemical usage against APVMA permissions	<u>What</u> : APVMA or AOA website <u>How</u> : inspect and print off copies of chemical labels, chemical permits and Material Safety Data Sheets <u>When</u> : prior to harvesting <u>Who</u> : farm owner	FSANZ - Food Standards Code Section 1.4.1	Take samples for testing. Do not harvest fruit if there is contamination	6.7 Grower Declaration
Ensure the olives do not have significant spoilage due to fungal or insect damage	Anthracnose or sooty mould or olive lace bug infestations may be included with good olives	Tag any trees that are not suitable for picking	<u>What</u> : visual inspection of all trees <u>How</u> : look at each tree <u>When</u> : prior to harvesting <u>Who</u> : farm owner, manager supervisor	More than 5% of the foliage with sooty mould or presence of any live olive lace bugs or anthracnose	Use brightly coloured flagging tape to mark any trees that are not to be harvested	Mark the location of diseased trees on farm map

Hazard Management Table – ON-FARM



OliveCare® 180 Best Practice Conversations

Grove Establishment (8 items) - for those establishing a new grove or replanting. **Biosecurity** (20 items) - it pays to be prepared;

Enterprise Sustainability (12 items) - including managing enterprise risk and benchmarking grove productivity to improve enterprise profitability;

Regulatory Compliance (19 items) - be a responsible business;

Environmental & Community Responsibility (13 items) - build a sustainable future;

Grove Management (30 items) - how to be a leading olive producer;

Integrated Pest and Disease Management (IPDM) (23 items) – achieve effective and responsible use of agri-chemicals;

Processing (26 items) – including EVOO and table olive production - understanding essential elements of olive processing;

Product Quality and Storage (13 items) - including EVOO, flavoured olive oil and table olives;

Product Packaging, Labelling & Distribution (16 items) – develop standard operating procedures (SOPs) for finished product packaging and distribution.









Grove design and olive cultivar selection best practice:

These factors will also determine potential grove productivity:

- Consider tree planting density (low density, high density, super high density) and canopy architecture, proposed harvest method, frost control, soil moisture management (berms and drainage channels), wind breaks and staking of young trees;
- □ Consider olive cultivar selection including verification of DNA status, regional environment, agronomic (pollination, tree vigour, precocity, alternate bearing), pest and disease resistance, frost tolerance, market attributes (Oil: oil content, extraction efficiency, flavour profile, oxidative stability; Table Olives: flesh: stone ratio, fruit size, flesh quality (resistance to bruising, sensory profile for the intended processing method).







Australian Olive Production:

Noting Hort Innovation olive production data for 2019 (which was an 'on crop' year), estimated the total Australian crop at 125,000 tonne. The 2021 crop is likely to exceed this figure. According to the <u>Australian Tree Crop Mapping</u> project data the total olive grove area in Australia is 30,533 ha. (It is also thought that Australian olive tree nurseries have sold over 10 million trees, mostly planted at medium density). Olive groves are marked in purple colour.



presents draft mapping of commercial horticulture tree crops across Australia.

The contribution of industry is critical to updating the map, this app enables experts to contribute by adding comments directly to the map, which are then reviewed by the AARSC team when updating the Australian Tree Crop Map.

Of particular interest are new crops (which cannot be identified using satellite imagery).

The project is led by the University of New England, and supported by Hort Innovation under the Australian Government's Rural R&D for Profit program.

Which tree crops are being mapped?

avocado banana citrus macadamia mango olive



More information About the Industry Engagement Web App About the National Tree Project

Contact us









Grove productivity:

- A 2019 grower survey revealed Australian grove productivity ranged from zero to 15 tonne / ha, with median production <1.0 tonne / ha.
- AOA is repeating the grove productivity survey in July/ August this year, your participation in this important survey is encouraged.



AOA July 2019 Survey: Distribution of Australian olive grove productivity in tonne / ha over 3 seasons







OliveCare® productive & profitable farms checklist:

Implement world best practice business management:

The *OliveCare*[®] best practice program emphasises the value of benchmarking grove performance - setting Key Performance Indicators (KPIs) for improved grove productivity and profitability, including:

Benchmark grove performance – set KPIs for grove productivity and profitability:

- Grove productivity KPIs: kg / tree, tonnes / ha;
- Cost of production cost \$/tonne, \$/Lit.
- Gross Margins \$/ha

Benchmark processing performance – set KPIs for processing productivity and profitability:

- Processing efficiency KPIs: Lit oil / tonne;
- Cost of processing cost \$/lit; or \$/kg.
- Benchmark product quality enter olive products in the AIOA and other olive competitions - Shoot for Gold!
- □ Ensure written commercial service and supply contractual arrangements are in place.







OliveCare[®] canopy management checklist:

Maintain a productive tree canopy.

- Undertake pruning to obtain optimal canopy surface to volume ratio, in accordance with your method of harvest;
- Undertake maintenance pruning to manage biennial bearing and achieve optimal light penetration and air flow (which also assists with effective spray coverage);
- Undertake renovation pruning on older trees to lower tree height, reduce wood and open up the canopy to sunlight to generate new fruiting wood;
- □ Monitor grove temperatures and implement frost mitigation strategies.









Other useful <u>OliveCare</u> Grove Care Best Practice Checklists include:

- OliveCare® on-farm biosecurity preparedness checklist: Managing biosecurity risks to safeguard Australia's horticultural production from pest and disease incursions, and associated eradication / management costs.
- Agricultural chemical management checklist: Practice responsible agrichemical use to minimise chemical use while also protecting the industry from pests and diseases.
- Water use best practice: Be a responsible and efficient user of water.
- Soil health and tree nutrition best practice: Maintain the productive capacity of the soil without detriment to the environment.
- Integrated Pest and Disease Management (IPDM) Best Practice Checklist: Implement IPDM best practice to achieve effective and responsible agrichemical use.
- Harvest best practice checklist: Manage harvest to optimise fruit quality

 and grove productivity.









OliveCare® Best Practice Resources

Grove Management References:

- *'Olive Growing'* manual (*El Cultivo Del Olivo*) (RIRDC Publication 09-067, October 2010).
- *Hunter Olive Handbook (e-book)* purchase on-line from the Hunter Olive Association
- *'Organic Olive Production Manual'* by Paul Vossen, available for purchase through various on-line booksellers (approx \$20)
- *Handbook for a sustainable management of the olive groves'* (olive4climate 2019)

Useful grove management resources can also be found on the AOA & OliveBiz websites:

- Healthy Soils Field day resources: <u>https://olivebiz.com.au/healthy-soils-resources/</u>
- Compost and Composting resources: <u>https://australianolives.com.au/compost-and-composting/</u>







Are you interested in becoming a member of *OliveCare*®?

LEVEL 1 Fees	Licensing fees for 10,000 litres (or less) of OLIVE OIL products
\$105 ex GST	Licensing fees for 10,000 kilograms (or less) of TABLE OLIVE products
LEVEL 2 Fees	Licensing fees for between 10,001 – 100,000 litres of OLIVE OIL products
\$315 ex GST	Licensing fees for between 10,001 – 100,000 kilograms of TABLE OLIVE products
LEVEL 3 Fees	Licensing fees for 100,001 litres (or more) of OLIVE OIL products
\$2,100 ex GST	Licensing fees for 100,001 kilograms of TABLE OLIVE products.

- *OliveCare*[®] fees are charged annually in June in conjunction with AOA membership fees.
- Visit the OliveCare[®] page on the AOA website, or contact the OliveCare[®] Administrator at <u>olivecare@australianolives.com.au</u> for a membership application form.







Thank You !



Please complete the post webinar participant survey that will be sent to you.

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