

SUBMISSION to the QUARANTINE AND BIOSECURITY REVIEW
from the
Toolangi Certified Strawberry Runner Growers Cooperative
and
Victorian Strawberry Industry Certification Authority

Summary

This submission identifies three issues that are considered significant for continuous development of the strawberry runner and fruit industries in Australia.

1. audit of approved sources
2. alignment of diagnostic protocols for high risk pathogens
3. recognition of PT Schemes as significant contributors to the biosecurity continuum.

Recommendations

1. *Audit of approved/accredited sources*

Industry recommends the panel:

(i) recognise the need for regular audit of off shore approved sources that are currently used by industry to import strawberry germ plasm.

(ii) endorse a cross industry review of policy of approved sources by Biosecurity Australia that will include an evaluation of whether sources reduce risk and are important components of the Biosecurity continuum.

Notes:

1. Audit is a short term operational issue that is the responsibility of AQIS and needs input by regulatory and technical experts. Audit is relevant when sources introduce changed protocols that differ from the original agreement approved by Australian authorities. It is considered an essential part of risk management.
2. A Review should consider consistent cross industry approaches based on technical and regulatory standards and specify guidelines for approval, funding audit and review.

Background

Industry has requested consideration of the need for audit of approved sources from Biosecurity Australia. In one case the source was approved in 1994/95 but there has been no subsequent audit.

The issue was discussed at a meeting with BA and AQIS managers in Feb 2005. Follow up was by two subsequent letters (March 2005 and July 2006) and also by presentation to an October 2006 meeting of the Post Entry Plant Industry Consultative Committee.

2. *Alignment of contemporary diagnostic protocols for high risk pathogens*

Industry recommends that the panel:

note the increasing application of molecular technologies that identify the causal agent rather than symptoms, and which are frequently used to diagnose plant viruses and virus like organisms

endorse the need to align new and improved diagnostic protocols used off and on shore, by approved sources and PEQ laboratories, for detection of exotic threats

endorse an analysis of implications of new molecular diagnostic tests for AQIS manuals, associated databases and operations

Background

The issue relates to the need for consultation and alignment of protocols when new or modified diagnostic technologies are introduced by approved sources. This apparently has not been recognized as a significant risk management issue by BA and AQIS.

It covers both technical and regulatory matters.

Technical: An example is Foundation Plant Services (FPS) in California that was ratified as an approved source some 13 years ago. At that time the technology for virus (and virus like organism) indexing relied on biological indexing and limited ELISA tests. In 2008 FPS protocols for strawberry viruses now incorporate a number of molecular tests. In other words change has been introduced by the source but there has been no consultation through the audit process.

Independently VSICA has commissioned R&D to evaluate benefits of molecular testing for endemic viral pathogens. In summary the results show high levels of sensitivity but they identify significant risk associated with sampling time and interpretation of results. The question of whether this is appreciated by FPS is not understood. It is clearly a risk management issue that could be dealt with as part of the audit process.

Regulatory: The move from biological indexing to molecular tests also has significant regulatory implications that will require consideration by BA and AQIS. Biological indexing identifies symptoms that are recorded in AQIS manuals, whereas molecular tests identify the organism, particularly its genomic characteristics. This means that there is a requirement to review implications of molecular testing for manuals and databases that guide operational procedures. There will be an increasing need to ensure reference is to the organism rather than symptoms associated with the organism.

3. *Recognition of PT schemes as significant contributors to the Biosecurity Continuum*

Industry recommends that the panel:
endorse the biosecurity and productivity benefits of schemes that certify product derived from PT stock

recognise the high levels of integration required for effective maintenance and development of schemes – involving industry, off shore laboratories, PEQ labs, BA policy, State regulatory and R&D agencies

endorse a proposed national review that demonstrates value of the Biosecurity continuum and, in particular, addresses the need for improved harmonization between stakeholder agencies and organisations

Background

PT schemes are a prime example of the benefits of the continuum from Offshore through to Farm, yet this seems not to be fully appreciated by agencies within National and State Government.

Implementation of the principles of risk management by government (regulatory & technical) and industry require shared understanding and integration. Industry has endeavoured to maintain active communication with BA, AQIS and State Regulatory bodies, and also through R&D partnerships. However the lack of response to industry communiqués, and the lack of support for some elements of R&D, indicates a significant problem. It seems that “silo” mentality may be impeding the process of integration and shared understanding that are considered essential for a harmonized approach to the Biosecurity Continuum. It begs the question of whether Government considers PT and related schemes as beneficial. This issue extends beyond strawberries to other PT and related schemes.

Additional Background Information

1. Production of strawberry runners derived from Pathogen Tested stock in Australia

TCSRGC and VSICA are independent businesses involved in production of certified strawberry runners derived from pathogen tested stock for sale to the Australian fruit industry. The rationale for use of certified cultivars from a PT scheme relates to productivity and quality benefits for consumers and farmers.

Although there are no experimental records that compare PT with non PT material, retrospective industry intelligence dating back to the 1950's shows that certified product derived from PT stock is associated with increases in productivity well in **excess of 10 fold**. In addition there is an increasing awareness of the benefits of such schemes to Australia's Biosecurity system, in that they use protocols that reducing risk from exotic threats.

Protocols for production of Certified runner plants are documented in the *Victorian Strawberry Runner Certification Scheme (the Scheme)*. This was originally conceived by Victorian government scientists and regulators, and further developed by industry.

Production of certified strawberry runners involves high levels of expertise in pathogen diagnostics, hygiene, plant production and management.

VSICA manages strawberry germplasm on behalf of a number of national clients. It is an incorporated association and operates as a not for profit organisation. VSICA has responsibility for management of the pathogen tested nucleus of cultivars from which certified runners are derived, for production of the second stage foundation generation of plants and for inspection of runner crops intended for ratification as Certified. Its activities are defined in the *Scheme*. Highly technical diagnostic and related expertise is provided under contractual arrangements from DPI Vic. VSICA interacts regularly with this group and has recently developed two collaborative R&D projects. One will introduce new diagnostic methods for strawberry pathogens. The other will develop soil less systems of production for the foundation stock generation. This is an alternative to small scale production in insect proof cages in soil fumigated with Methyl Bromide.

TCSRGC is a client of VSICA and produces an estimated 40 million strawberry runners of specified varieties in response to orders from national fruit growers. It is located in the Toolangi Plant Protection District and the Scheme, under which it operates, has statutory approval specified in the Plant Health and Plant Products Act 1995. TCSRGC orders and purchases foundation stock runners from VSICA and multiplies them twice, stage 1 is known as the mother stock generation and stage 2 the certified generation. VSICA inspects both to ensure compliance with plant health and related standards specified in the *Scheme*. TCSRGC uses methods of field production that comply with specifications of the *Scheme*. Field soils are fumigated in April/May, runners are planted in August to October and harvested from April to June. Certified bare rooted runners are consigned to all states involved in commercial fruit production.

A major additional biosecurity issue for TCSRGC is government co-investment in R&D to find alternatives to the soil fumigant methyl bromide (MB). The driver is a public health issue because MB is a serious ozone depleting chemical and linked to skin cancer but there is significant discontinuity in agency funding to resolve this issue.

Note:

- Queensland also has a system of runner production that incorporates the principle of pathogen testing but does not sell its product as Certified. It comprises two businesses, based in Stanthorpe, that multiply runners of selected cultivars for sale to the national fruit industry.

2. Importation of Strawberry Germplasm and Associated Diagnostic Tests

TCSRGC, OzFresh and the Queensland runner industry all import strawberry germplasm from accredited and non accredited sources.

Biosecurity Australia and AQIS endorsed the concept of accredited sources. Details are presented in the AQIS ICON database that specifies import conditions for plant material.

It is understood that protocols for establishing an organization as an approved source require confirmation that facilities, plant and hygiene management, diagnostic capacity and documentation align with AQIS specifications. After appropriate confirmatory checks by AQIS, agreements are signed and the approval status recognized in ICON.

All strawberry germplasm is now imported in tissue culture. Bare rooted plant imports are no longer permitted. Importation is allowed from either approved or non approved sources. Plant material from each is treated differently on arrival in Australian Post Entry Quarantine, as summarized in Table 1.

Table 1 Summary of the different entry requirements for strawberry runners from approved and non approved sources

Entry requirement	Approved source	Non approved source
Phytosanitary certificate	yes	no
Duration in quarantine	12 months	18 months
Indexing for pathogens	Visual	Active indexing (grafting, ELISA)

ICON identifies four approved sources for strawberry germplasm:

1. Foundation Plant Services, University of California, One Shields Ave, Davis CA 95616-8600 USA
2. Driscoll's Strawberry Associates Inc., 345 Westridge Drive, Watsonville, CA 95076 USA
3. *Fragaria* spp (Strawberries) - Accredited Sources - Israel (SCU3) - other than tissue cultures; *Fragaria* spp (Strawberries) - Accredited Sources - Israel (SCU3) - tissue cultures
4. *Fragaria* spp. tissue cultures imported from approved sources (East Malling Horticultural Research Station, Kent, UK)

It is understood that there is proviso for Sources to be periodically audited to check standards, protocols and new technologies.

Approved source laboratories and those at AQIS PEQ run diagnostic tests for exotic pathogens of strawberry, these cover 2 bacteria, 1 fungus, 6 viruses and 6 phytoplasmas (refer ICON database for details). Also VSICA contracts DPI Vic to test for important endemic pathogens, this covers 1 bacterium, 3 fungi, 6 viruses and 1 phytoplasma.

Until recently most diagnostic tests relied on (i) isolation of the bacteria and fungi by agar culture and (ii) biological indexing for viruses and phytoplasmas by graft transmission to indicator plants.

New molecular technologies developed in medical science are now gradually offering very sensitive alternative methods. In the last three years these have been partially adopted by o/s laboratories such as Foundation Plant Services.

VSICA has co-invested with Horticulture Australia Ltd and scientists from DPI Vic in R&D to develop validated molecular diagnostic tests for endemic virus and virus like organisms. The intent is to integrate these with biological indexing for active testing of the plants in the nucleus from which PT cultivars are developed for industry. Pending success this would increase biosecurity, flexibility and may reduce costs. It's too early to draw conclusions but suffice to say that R&D has:

- Demonstrated feasibility of the molecular methods for endemic pathogens
- Demonstrated feasibility of extending the technology for use by AQIS in PEQ
- Identified important issues of alignment of new technologies with those used and being developed by diagnosticians in approved source laboratories
- Identified risks associated with sampling time and interpretation of results

3. Biosecurity Continuum

The application of PT schemes for industry is an excellent example of Biosecurity Continuum involving pre-border, border and post border activities.

International, national and state links involving Quarantine, Technical and Industry intelligence are applied to minimize risk from exotic and endemic pathogens. The strawberry industry experience shows that significant benefits are derived from adoption of high health plant improvement schemes. Beneficiaries are growers, government and consumers, and major factors include reduced risk from pests and diseases, reduced use of pesticides, increased productivity and quality.

These are important industry drivers. VSICA, TCSRGC, the Queensland runner Industry and National Fruit Industry recognize their significance as players in the Continuum. Continued success depends on integration of regulation, technology and industry practice across national and international organizations.

Experience shows that shared understanding and integration between and within agencies has not been fully achieved. There is a need for further analysis and harmonization.