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An R&D Strategy for the Australian Pomegranate Industry


RIRDC Publication No. 09/165



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Development Corporation**

An R&D Strategy for the Australian Pomegranate Industry

by Jonathan Eccles

November 2009

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Foreword

The Rural Industries Research and Development Corporation (RIRDC) has identified pomegranates as a potential new crop for Australia, and has been working with current and potential participants to plan its development.

A strategic planning workshop to explore the potential future of this industry was held in Sydney on 27 November 2008.

Outcomes from that workshop, a previous industry analysis by Colin Lye and subsequent considerations by both industry and the research community have identified priority areas for research and development. This will help ensure the sensible investment of research funds in the most efficient and effective manner to maximise outcomes for the industry.

The process identified the following as the top three areas worthy of further investigation:

- The development of grower networks
- The creation of a better understanding of world markets and identification of market opportunities and niches
- The development of standard quality specifications.

This project was funded from RIRDC core funds which are provided by the Australian Government.

This report is an addition to RIRDC's diverse range of over 1900 research publications. It forms part of our New Plant Products R&D program which aims to facilitate the development of new rural industries based on plants or plant products that have commercial potential for Australia.

Most of RIRDC's publications are available for viewing, downloading or purchasing online at www.rirdc.gov.au. Purchases can also be made by phoning 1300 634 313.

Peter O'Brien
Managing Director
Rural Industries Research and Development Corporation

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Executive Summary

What the report is about

The Rural Industries Research and Development Corporation (RIRDC) has identified pomegranates as a potential new crop for Australia. This report presents a summary of the outcomes from a workshop, funded by RIRDC, to identify priority R&D issues for the pomegranate industry.

Who is the report targeted at?

This report will be useful for growers, researchers and processors interested in investigating the feasibility of establishing a pomegranate industry in Australia.

Background

With a wide range of suitable environments, counter seasonality to major producing countries in the northern hemisphere and good horticultural expertise in production and marketing, Australia is ideally placed to grow pomegranates.

While pomegranates have been grown in Australia for many years, it has always been considered a non commercial crop. There is no organised industry but there are several large commercial developments taking place. Fresh fruit is able to be imported from the United States of America as quarantine restricts access from other countries. Retail ready juice products are also imported as well as frozen concentrate for reconstituting with other juices.

Pomegranates have become a popular fruit world wide due to increasing awareness of the health benefits of the fruit. While there are opportunities for developing pomegranates in Australia, it is important that overly optimistic projections for growth are tempered with the reality of external competition from the rapidly developing world market which includes some very low-cost producers.

Aims and objectives

The workshop aimed to answer the following questions:

- Is this an industry worth developing in Australia?
- What are the industry research and development needs?
- What are the realistic market potential and opportunities for Australian producers in pomegranate processing, fresh fruit, juicing, aril extraction, exporting, and organic production?
- With commercial development already taking place, what are suitable areas of research and development where RIRDC could assist the industry?

Methods used

The participants discussed the national and international environment applying to this industry as it tries to establish in Australia. They undertook an evaluation of the industry's strengths, weaknesses, opportunities and threats, and discussed priorities for taking the industry forward.

Results and Recommendations

While a number of other research and development areas were identified at the workshop, it was agreed that the three with the highest priority were:

1. Development of grower networks
2. Creation of a better understanding of world markets and identify market opportunities and niches
3. Development of standard quality specifications.

Introduction

RIRDC's New Plant Products research program has as its objective: *To facilitate the development of new industries based on plants or plant products that have commercial potential for Australia.*

RIRDC has identified pomegranates as a potential 'new' crop for Australia. Before investing in any research and development involving pomegranates, RIRDC had decided to hold a strategic planning workshop to identify priority issues and areas for RIRDC investment.

Background

Pomegranates have been grown in Australia for many years. However, the market has been extremely small with little consumer demand. Plantings were based on seedlings and fruit quality and productivity varied greatly.

Consumers have become more aware of the relationship of good health and food intake, especially from naturally derived foods such as fruits and vegetables. These foods are often referred to as functional foods; foods which not only taste good but are known for their health and wellbeing benefits. The pomegranate fruit which is renowned for its health benefits has become very popular world wide over the last five years.

Pomegranates are grown in several countries. The largest plantings are to be found in India (90,000ha), Iran (50,000ha), Turkey (8,000ha), USA (6,000ha) and Spain (3,000ha). New plantings are increasing rapidly in these countries to meet the world wide demand. South Africa is now also developing an industry.

While no figures are available in Australia, it is estimated that nearly 250ha are currently grown with a similar projected area for new plantings. The harvest season is March to September although in some areas, rain and frost will stop harvest past late May. New plantings in northern regions could provide Australia with all year round harvest.

About 700t of Californian fruit are imported during October to March for fresh marketing. This is sourced mainly from POM Wonderful, the largest producer and marketer of pomegranates in the United States. Small amounts are also exported from other companies such as Simeon Fruits.



Development of the Australian market appears to be slow but could well take off once consumers become familiar with pomegranate products and the health benefits they offer.

Why pomegranates could be a useful new crop?

Meeting growing consumer demand for health products:

Pomegranate juice is high in three different types of polyphenols, a potent form of antioxidants. The three types - tannins, anthocyanins, and ellagic acid - are present in many fruits, but pomegranate juice contains particularly high amounts of all three. As antioxidants, they are credited with helping in the prevention of various cancers and heart disease.

Adaptable to a wide range of climates:

With no need for winter chilling, pomegranates grow well in environments suitable for citrus, olives and vines. They generally are unsuitable for subtropical regions where rain at harvest can split the fruit. However, there are sub tropical varieties such as Ganesh or Bhagwa that could possibly tolerate some rain at harvest.

Production:

They are adaptable to wide range of soil types and require less water than many other horticultural crops such as citrus and almonds. Pomegranates also have good tolerance to slightly saline water (less than E.C. 4.0).

The pomegranate grows into a large shrub, reaching 6 -10m tall and has a tendency to sucker. The fruit can vary from 6-12cm diameter and has a tough, leathery skin. The interior is separated by membranous walls and white spongy tissue into compartments containing transparent sacs (arils) filled with a tart, fleshy juice. In each aril, there is one seed.



Issues to consider

While there are opportunities for developing pomegranates in Australia, it is important that overly optimistic projections for growth are tempered with the reality of the rapidly developing world market and production from low cost producers.

RIRDC involvement with the industry

As a 'new crop' for Australia, the pomegranate falls into RIRDC's category of New Plant Products. While pomegranates have been grown in Australia for many years, there has been no serious commercial production until recently. The impediments to its development as a commercial crop have been the lack of good varieties and low consumer demand. This is likely to change with new high yielding and better quality varieties and increasing market awareness of health foods driving consumer demand.

Commercial development is already taking place and plantings are set to increase. Some pomegranate enterprises are involved in their own research and development, adapting overseas production technology and developing varieties and markets. The industry will be keen to ensure that any investment in research and development is directed towards issues that have not yet been addressed. To achieve this, the industry needs to develop a leadership group that not only can be a point of contact for RIRDC when assessing relevant research applications but would ensure that any future publicly-funded research addresses new areas that benefit both existing and new participants the industry.

Processing

The market has not only developed for fresh fruit but pomegranate juice is becoming a popular 'health' drink. Processing into juice also means that pomegranates become a world traded commodity, in the way orange juice has become as a frozen concentrate. Australian production would therefore need to be either competitive or develop niche markets to be viable.

Value adding of the fruit such as removing the arils for ready to eat would encourage consumption. Hand labour would be too costly but mechanical extractors have been designed with varying success. Hand extracting of arils is done in India where labour is relatively cheap.

Export and quarantine

Australia is recognised as having Queensland and Mediterranean fruit fly species. These pests have required quarantine protocols to be developed and accepted by importing countries such as New Zealand, Japan and many other Asian countries.

Pomegranates are a recognised host of fruit fly so any export market initiatives will be limited to only those importing countries which are not concerned with these pests. However, the more affluent markets which are likely to be demanding fresh pomegranates are those countries which require stringent fruit fly disinfestation protocols to be in place.

The development of disinfestation or area freedom protocols is generally beyond the resources of individual businesses. Market access for other fruit has been supported by public funds as the outcomes of such research have wider industry benefits.

While Australia could be considered counter-seasonal with major northern hemisphere producers, we are not a low cost producer. While cheap labour is available in India and Iran, fruit from these countries is highly variable in quality. South Africa will be a major competitor once new plantings

bear fruit and their cost of labour is significantly less. Also, to achieve reasonable volumes that any export market requires, enterprises may need to have the necessary critical mass to meet demand.

Pomegranates do have a considerable storage life when using best practice postharvest procedures. This could work in Australia's favour as the product can be shipped to overseas markets using shipping freight rather than air.



Pomegranates contain red arils that are heavy with juice. Inside each aril is a tiny edible seed that provides valuable fibre and can be eaten along with the aril. Oil can also be extracted. The white membrane that surrounds the arils is bitter and not recommended for consumption.

Some questions that were asked at this workshop:

- Is this an industry worth developing in Australia?
- What are the industry research and development needs?
- What are the realistic market potential and opportunities for Australian producers in pomegranate processing, fresh fruit, juicing, aril extraction, exporting, and organic production?
- With commercial development already taking place, what are suitable areas of research and development that RIRDC should invest?

Workshop agenda

1.	Welcome and introductions	Facilitator: Richard de Vos
2.	About RIRDC – Alan Davey, Senior Research Manager - New Plant Products	Role & activities of RIRDC
3.	Background	A look at what has been done so far
4.	The Current Situation	<p>Brief summary of:</p> <p>Size, structure and trends in the Australian industry</p> <p>Trends and key drivers in overseas production and processing</p> <p>The latest nutritional information and directions</p> <p>Products and processing</p>
5.	The Australian industry - A SWOT Analysis	Develop an understanding of the industry's Strengths, Weaknesses, Opportunities and Threats
6.	To develop and grow . . .	What might be done to support/develop the Australian industry?
7.	How can RIRDC support?	Based on what is determined as industry needs.
8.	Where to next?	<p>What needs to happen</p> <p>Responsibilities</p> <p>Timing</p>

Issues raised during the workshop

- There is no published research in Australia. However, there are records of results of varietal trials with the Departments of Primary Industries in New South Wales (Dareton) and South Australia (Loxton). Trials undertaken at Waikerie, South Australia over a period of years recorded yield data and made comments on fruit/juice quality. This work took place in up to mid 1990s but results are still useful and should be reviewed. Commercial businesses have been doing their own agronomic research and varietal evaluation.
- Industry is presently very fragmented with little sense of industry cohesiveness.
- The pomegranate industry has a high labour cost mainly due to the need for manual harvest. Also, several harvests are required rather than a once only pick. With no abscission layer in the stem, it makes mechanical harvesting difficult and even then, would only be considered for processing.
- Labour is the limiting issue. While the crop may tolerate poorer quality land compared to most horticultural crops, consideration needs to be given to having the other necessary infrastructure in place such as transport and a local source of labour.
- Pomegranates do not have any chilling requirement for flowering. They bear flowers indeterminately so fruit is always there. In India, there are two harvests per year.
- There are no thornless varieties. The right varieties need to match the specific market. There is a large variation in internal colour and in sweetness.
- We should make use of Australia's counter seasonality to northern hemisphere countries. There is four month window for exporting from Australia. There are no exports of Australian pomegranates at the moment.
- UK consumers swap from eating pomegranate to summer fruit in May as summer fruit comes into season and is price competitive. This is more an observation and not market researched.
- In Australia, pomegranates are sold as fresh fruit while juice is made from imported concentrate. Australian supermarkets do not rate pomegranates as a significant product and only buy from wholesalers, not direct from producers. Local product has inconsistent quality.
- We do not really know who is buying pomegranates in Australia. Mediterranean and Asian background people are the most likely consumers.
- 95% of fresh imports come from USA due to quarantine restrictions on other pomegranate producing countries. POM Wonderful, based in California, is the major supplier to Australia. There is an opportunity for import replacement.
- Overseas import and export information on pomegranates is grouped with other minor fruit, so it is not possible to get good information on international markets. We do need to have a better understanding of world markets.
- India and Iran produce hand extracted arils and air freight to markets in Europe. They produce juice and oil as well as fresh fruit.
- Production is increasing in Iran and Afghanistan. Israeli companies are setting up in India using the cheaper labour and will be producing premium juice for the European market.
- Chile has about 400 to 500 ha planted. Peru is also increasing production. Other countries planting pomegranates are Argentina and Mexico.
- South Africa originally planted Indian varieties but is now planting Israeli and Wonderful varieties to target the European market. Their experience with exporting citrus and grapes already provides an existing export infrastructure. They also have advantage of cheaper labour.
- In USA, POM Wonderful in California has 80% product going to juice with only 20% of product is marketed fresh and 50% of that is exported. Production is 200,000 tonne per annum. Average yields are 30t/ha. POM Wonderful have made considerable investment into generating information for a USA health claim.

- There is already a large amount of production information available. Seeking this out is best left to commercial operators. Research into varieties and harvesting mechanisation are commercial activities.

SWOT Analysis for the Industry

Strengths

- Good quality product, good image, 'clean and green' particularly in Asia
- It is a young industry in Australia so no 'baggage' to stifle innovation
- Healthy product suited to a health conscious domestic market
- Australia has good climate and growing environments for pomegranates. These regions are isolated from one another which is advantageous if we get an incursion of an exotic disease (see citrus and canker in Queensland as an example)
- Pomegranates have a range of uses not just as a fresh product
- Good transport, cool chain, service infrastructure exist in Australia
- Positive image of Australia overseas as a source of good fruit
- Good horticultural knowledge exists in Australia
- Pomegranates have less water requirements than most fruit and can tolerate poorer quality irrigation water
- Good alternative crop for marginal areas
- Seasonal difference with northern hemisphere producers and also within Australia due to varying climates.

Weaknesses

- Australia's image overseas as a Pomegranate exporting country – (industry too small to be reliable)
- Pomegranate not considered consumer friendly – requires fiddly preparation
- Undeveloped domestic market
- No production data or ability to forecast
- Market access – Pomegranates are a recognised host of fruit fly
- High labour costs compared to other pomegranate producing countries
- No mechanisation for harvesting
- No coordinated structure to represent industry, no network
- Limited knowledge and expertise of pomegranates.
- Little knowledge on varieties
- Lack of consumer market research
- Lack of funds for research, development and promotion
- Australia's carbon footprint – perceptions from importing countries, particularly Europe, that the 'Food Miles' issue may be used to Australia's detriment.

Opportunities

- Underdeveloped domestic market
- Value adding potential
- Develop grower network
- Standardise quality control, specifications
- One brand for export markets
- Address market access barriers
- Import replacement
- New product in the market place – creates excitement amongst consumers and food media
- Counter seasonal to northern hemisphere
- Research on health attributes of pomegranates. Even ‘piggy back’ on other related work being done with other fruit.
- Health professional endorsements.

Threats

- Variability in exchange rates
- Shrinking overseas markets opportunities
- Increasing production in other countries
- Imported product tarnishing local product’s reputation
- Fragmented industry
- Labelling, especially juice (‘Made from local and imported juice’ – a ‘cop out’ by juicing companies). No test available to guarantee proportion of real pomegranate juice
- Pest and diseases
- Incursions of new pests – as an undeveloped industry, it doesn’t have resources to argue a case for import risk analysis
- Production from India, particularly production of arils due to cheap hand labour
- Availability of water
- Negative press on medical research
- Competition from other functional foods.

POM Wonderful, based in California, go to considerable lengths to promote their fruit as seen in this specially designed end of aisle display in a Publix Supermarket in Florida.



Priority issues identified by the group

- Better understanding of world markets; identify opportunities, market niches for Australian product
- More information on growing requirements (irrigation needs, coolchain, labour, etc)
- Research on varieties, suitability for different markets, matching right varieties for end use (fresh, juice, aril, etc)
- Investigate mechanical harvesting techniques
- Investigate 'organic' market potential, here and overseas
- Understand the consumer market in Australia and overseas
- Market-test different varieties
- Targeted marketing
- Investigate grower networks – what models are there?
- Develop standard quality specifications
- Develop 'data package' for fruit fly and any other quarantinable pests for market access to identified overseas markets
- Investigate food service opportunities
- Match production with market demand (requires industry stocktake, crop forecasting)
- Research into health attributes – comparing Australian product to overseas. Are there varietal differences? Undertake chemical analyses not human clinical trials which would be too expensive and establishing a health claim is too difficult.

Recommendations

- The workshop agreed that there were a number of activities that were more appropriately handled by each individual commercial interest. There is much information available on the cultivation of pomegranates. Adapting this information to Australian conditions was considered a commercial activity.
- There is an enormous range of varietal material available around the world, with the various markets and end uses requiring the appropriate type. Growers are already evaluating varieties. There is a risk that new growers will plant the wrong variety. It is vital that prospective growers investigate the market requirements and choose appropriate varieties. Commercial entities in Australia are already in the process of making suitable varieties available.
- Pomegranates do not suffer from major pests and diseases in Australia. However there is a risk of exotic diseases entering this country on imported fresh fruit. The industry does not have the resources to mount a challenge to requests from countries that may wish to send fresh fruit to Australia but are currently prohibited due to quarantine.
- It was recognised by the workshop that there is limited funding available from RIRDC. There is no national statutory levy arrangement in place. With no national organisation to drive any consultation process, the probability of a national levy being introduced in the foreseeable future is very unlikely.
- The group identified that funding for research and development could also be available from Horticulture Australia. This would require a cash voluntary contribution from commercial companies which can be matched by the Australian Government funds through Horticulture Australia.
- The workshop identified three priority areas for future research and development that would be appropriate for RIRDC funding support:
 1. Investigate development of grower networks
 2. Creation of a better understanding of world markets and identification of market opportunities and niches
 3. Development of standard quality specifications.

1. Investigate establishment of grower networks

This was suggested as one of the best ways to share public information on pomegranates and develop future research projects. With a small domestic consumer base, there are opportunities to establish effective marketing of the fresh fruit as well as investigate food service opportunities.

2. Better understanding of world markets, identify opportunities, niches.

The workshop considered that it was important to access as much information on world markets and the trends in pomegranate consumption. This is based on realising that the domestic market will always be small. If the industry is to expand, then a significant export market needs to be developed.

Australia is a high cost producer so we will never be able to compete on volume with low cost producing countries such as India. Therefore, it will be necessary to identify niche markets and opportunities for Australian pomegranate, either as fresh or processed.

In Australia, pomegranates are still a relatively unknown fruit. Little is known about who purchases them and how they are used. There has been no objective consumer market research carried out in Australia, so there is a need to explore consumer attitudes and purchasing trends for the domestic market. Food service is also an area that could be further investigated to expand the market for Australian pomegranates.

3. Develop standard quality specifications

As a 'new' fruit, there is a risk that the product that ends up on the market shelves will vary greatly in quality. This is most likely to turn consumers off from experiencing the fruit for the first time and jeopardising any repeat purchases. The network mentioned in (1) should be the driver and overseeing group to develop standardised specifications in consultation with retailers and wholesalers.

List of participants

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Mr Richard de Vos, Facilitator, Sydney

Mr Jonathan Eccles, Gosford, NSW

Apologies from Warwick Scherf, Horticulture Australia, Sydney.

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Commercialising pomegranates in Australia, Hartley Lewis, 2007, DAFF New Industries Development Program report.

Pomegranate Investment Background, Colin Lye, 2008, RIRDC Publication N°. 08/153.

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The Rural Industries Research and Development Corporation (RIRDC) is a partnership between government and industry to invest in R&D for more productive and sustainable rural industries. We invest in new and emerging rural industries, a suite of established rural industries and national rural issues.

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