

**“Overview of the early  
introduction and selection work  
on varieties”**

**or**

**THE ORIGINS OF THE AUSTRALIAN  
PISTACHIO INDUSTRY**

**START-UP RESEARCH COVERING  
INTRODUCTIONS, VARIETIES AND  
ROOTSTOCKS**

# **FIRST INTRODUCTIONS OF *PISTACIA* GERMPLASM**

- **NSW DEPARTMENT OF AGRICULTURE, YANCO.  
FIRST IMPORTATION 1935**
- **CSIRO DIVISION OF HORTICULTURE, MERBEIN.  
IMPORTATION 1965**

# CSIRO 1965 SEED INTRODUCTIONS

## *Pistacia vera*

- Red Aleppo
- Trabonella

## *Pistacia atlantica*

## *Pistacia mutica*

# CSIRO BUDWOOD INTRODUCTIONS

**1967 – ex NSW Department of Agriculture**

**1967-to-1990 – ex International sources**

Germplasm collection, comprising seedling selections, named varieties, selections from overseas, maintained at Merbein until site closure announced in 2008.



# PISTACIA ACCESSIONS AT CSIRO

## *Pistacia vera:*

### **Females**

Kerman, Bronte, Sfax, Lassen, Badami, Mumtaz, Ohadi, Vahedi, Red Aleppo, El Guettar, Sirora, Trabonella, Larnaca, Kalaghochee, Sayfhadeeny, Sapdeed Pesteh Noguee, Chorock Khordeh, Mohseny, Italian, Lock Sirizi, Pontikis.

**(Plus selections from overseas only known by introduction numbers.)**

### **Males**

Peters, Chico No. 26, Egino No. 31, Mateur No. 24, and a range of CSIRO selections which are used as industry standards in Australia.

## **Other *Pistacia* spp. held included male and female trees of:**

*P. atlantica*, *P. terebinthus*, *P. integerrima*, *P. mutica*, *P. lentiscus*,  
*P. khinjuk*, *P. chinensis*

# EARLY SEED INTRODUCTIONS

- **Germinated**
- **Rowed out as unique seedlings at Coomealla and Merbein**
- **Observed and evaluated**
- **Promising female and males selections identified and entered into trials**

# **INITIAL WORK LEADING TO SELECTION OF SIRORA**

- **100 seeds from a tree labelled Red Aleppo, Chico, California**
- **Germinated at Merbein and surviving seedlings rowed out at CSIRO Coomealla**
- **Tree 15-11 (Row 15, tree 11) selected as PT133 and entered into trials**
- **Male selections also made**

# TRIALS ESTABLISHED FROM EARLY SINGLE TREE SELECTIONS

- **CSIRO Merbein**  
2 balanced trials
- **NSW Department of Agriculture, Dareton**  
Observation and budwood source block
- **SA Department of Agriculture, Irymple**  
5 scion varieties (PT133, Kerman, Lassen, Bronte, 15-19); 3 rootstocks (*P. terebinthus*, *P. atlantica*, *P. Vera*)
- **Victoria Department of Agriculture, Irymple**  
PT133 & Kerman on 4 *P. terebinthus* and 1 *P. atlantica* rootstocks

# PISTACHIO COLLECTION AT ARAS, NSW AGRICULTURE, DARETON

| OFFICES ↗               |                       |                       |                                     |
|-------------------------|-----------------------|-----------------------|-------------------------------------|
| <b>B2</b>               | <b>PT61/16-20</b>     | <b>Kerman/B11</b>     | <b>Sirora/B11</b>                   |
| <b>B18</b>              | <b>PT92/16-20</b>     | <b>Kerman/B11</b>     | <b>Sirora/B11</b>                   |
| <b>B14 (♂)</b>          | <b>PT96/16-20</b>     | <b>Kerman/B?</b>      | <b>PT104/B18</b>                    |
| <b>17-1</b>             | <b>19-22 (5♂)</b>     | <b>19-22/B18 (5♂)</b> | <b>18-19/B18 (6♂)</b>               |
| <b>17-2</b>             | <b>PT98/16-20</b>     | <b>15-12/B18 (3♂)</b> | <b>B22/B18</b>                      |
| <b>PT96</b>             | <b>PT100/16-20</b>    | <b>PT96/B2</b>        | <b>Sirora/B18</b>                   |
| <b>PT22 (Peter's ♂)</b> | <b>PT101/16-20</b>    | <b>Kerman/B2</b>      | <b>PT111/B18</b>                    |
| <b>PT111</b>            | <b>PT103/16-20</b>    | <b>Kerman/B11</b>     | <b>Sirora/B?</b>                    |
| <b>PT104</b>            | <b>15-12/B15 (3♂)</b> | <b>Kerman/B11</b>     | <b>Sirora/B?</b>                    |
| <b>PT111</b>            | <b>PT104/B14</b>      | <b>Kerman/B11</b>     | <b>Sirora/B11</b>                   |
| <b>PT104</b>            | <b>PT107/16-20</b>    | <b>Kerman/B11</b>     | <b>19-8 (4♂)</b>                    |
| <b>18-19 (6♂)</b>       | Unknown <i>vera</i>   | ♂ <i>terebinthus</i>  | <b>16-20 (<i>terebinthus</i> ♀)</b> |
| <b>Main road</b>        |                       | <b>➔ Coomealla</b>    |                                     |

# CSIRO MERBEIN TRIALS 1977

## Trial 1 – planting method and tree training trial

- 2 scions
  - PT133 and Kerman
- 2 *P. atlantica* rootstocks
- Terminated 1986 – problems.

## Trial 2 – Scion x rootstock evaluation

- 9 scions
  - PT133, Kerman, Bronte, Sfax, El Guettar, Red Aleppo, PT111, PT104 and B4
- 5 rootstocks
  - 4 *P. atlantica* and 1 *P. terebinthus*
- Yield and nut quality assessments 1984-92.

# EXTENSIVE ROOT SYSTEM....



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# CSIRO MERBEIN SCION X ROOTSTOCK TRIAL

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  - Yield and nut quality assessments 1984-92.
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- PT133 highest yields; Sfax next highest, B4 lowest
  - Kerman largest nut (1.2g), PT133 (1.1g), Sfax (0.7g)
  - Sfax highest split (96%), PT133 (90-95%), Kerman (70%)
  - Rootstock influenced % split; *P. atlantica* > *P. terebinthus*

# OTHER TRIALS

Grower-based observations with PT133 and other female and male selections.

Other varieties as introduced

# RELEASES FROM MERBEIN

- Sirora (PT133)
- Males
- Rootstocks



# SIROA FLOWERING



# MALES

TABLE 1 Male Seedlings Grouped According to their Mid-Flowering Date

| Group                  | 1      | 2      | 3      | 4      | 5      | 6      |
|------------------------|--------|--------|--------|--------|--------|--------|
| Days lag after Group 1 | 0      | 5      | 10     | 15     | 20     | 25     |
|                        | 14-6   | 14-14* | 14-7 * | 14-1   | 14-4 * | 18-4   |
|                        | 14-9   | 14-15* | 14-10* | 14-3   | 17-18  | 18-14  |
|                        | 14-11* | 14-19  | 15-3 * | 18-3 * | 18-12* | 18-19* |
|                        | 20-12  | 20-2 * | 15-4 * | 18-5   | 19-6 * |        |
|                        | 21-5   | 20-13* | 15-5 * | 19-5 * | 19-14  |        |
|                        | 23-7   | 20-15* | 15-6 * | 19-8   | 19-22  |        |
|                        |        | 20-16* | 15-12* | 19-9 * |        |        |
|                        |        | 23-15* | 15-14* | 19-13* |        |        |
|                        |        |        | 15-17  | 19-16* |        |        |
|                        |        |        | 18-6   | 22-15* |        |        |
|                        |        |        | 20-4 * |        |        |        |
|                        |        |        | 20-18* |        |        |        |
|                        |        |        | 23-2   |        |        |        |
|                        |        |        | 23-5   |        |        |        |

\* known to produce good pollen.

At Merbein most of the promising female seedlings and cultivars coincide with Group 4 although their first flowers overlap Group 3 and their last, Group 5. No. 17-18 in Group 5 is the standard Californian variety, Peters Male.

# **HISTORY OF CSIRO PISTACHIO IMPROVEMENT**

- **1965 – germplasm collection started**
- **1965-80 – variety and open-pollinated seedling evaluation**
- **1977 – Merbein trials**
- **1980 – Sirora and males released**
- **1983 – crossing program commenced**
- **1990 – new rootstock trials**
- **1995 – new selections made**
- **2004 – advanced selections**
- **2004 → Elite selections (grower test plots)**

# BREEDING PROGRAM

- Synchronising flowering
- Crossing
  - 8 females
  - 3 males
  - 8 x 3 progenies
- Open-pollinated
- R/S program



# BREEDING PROGRAM – PARENT SELECTION

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## FEMALE PARENTS

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SFAX (group 1)  
PT137 (O/P seedling, group 2)  
PT130 (O/P seedling, group 3)  
SIRORA (group 3-4)  
KERMAN (group 4)  
LASSEN (group 4-5)

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## MALE PARENTS

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PT161 (Red Aleppo seedling, group 3)  
PT163 (Kerman seedling, group 5)  
PT167 (Lassen seedling, group 5)  
PT134 (Red Aleppo seedling, group 3)  
PT142 (Kerman seedling, group 4)  
PT367 (Lassen seedling, group 4)  
PT195 (Red Aleppo seedling, group 3)  
PT132 (Trabonella seedling, group 2-3)

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# THERE WERE SELECTIONS.....

PT372



SIRORA



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