



THE UNIVERSITY OF ARIZONA

# Cooperative Extension

## Pomegranate Cultivars for Arizona

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### Introduction

Pomegranates are small trees or shrubs that grow well in a semi-arid climate. They are prized for their nutritious, healthy fruit, the arils containing the juice. Pomegranates are native to Central Asia where they have been cultivated for hundreds of years. They also thrive in the Mediterranean region since ancient times. The majority of all the commercial pomegranate acreage in the United States is located in the San Joaquin Valley in California. This area produces 'Wonderful', the most common variety grown in the US.

In Arizona, pomegranates were introduced 200 years ago by the Spanish and have been growing since in home yards. Recently one commercial orchard has been established in Southeast Arizona. The Mission Garden Project in Tucson is growing some heirloom varieties which have survived unattended for decades in old homesteads and abandoned towns in Arizona. There is increasing interest in cultivating these varieties and others to expand the palette of fruit beyond the 'Wonderful' variety which is characterized by orange flowers, and large deep-purple-red fruit outside and inside. Other cultivars vary in outside and inside fruit color from dark red to pink, yellow and white, in aril size and hardness, and in taste.

Pomegranates can be marketed as fresh fruit, juice, and arils ready for consumer use. With showy spring and summer flowers and attractive fall fruit, pomegranates can be a valuable, low-water use landscape plant as well. Cultivating pomegranates in Arizona is appealing because they require less water than other fruit crops such as citrus. Estimated yields range from 2100 lbs. of fruit per acre at age 3 through 8400 lbs. of fruit per acre beginning at age 6, at a potential value of \$1,000 to \$2,000 per acre net return after expenses.

### Project Goals

In 2012 we established a trial to test the performance of 32 varieties of pomegranates in three locations in Southern Arizona. The goal is to test the varieties for their suitability for commercial planting and landscape use.

### Materials and Methods

#### *Trial locations*

The three locations were Yuma, Tucson, and Bowie with elevations of 164 feet (50 m), 2300 feet (700 m), and 3700 feet (1128 m).

#### *Field layout*

Plants were transplanted in 2012 at a spacing of 15 feet within and 18 feet between rows. Four replicate plants of each cultivar were planted in a completely randomized design.

### *Plant material*

Of the 32 cultivars, 27 were received from the USDA-ARS-National Clonal Germplasm Repository in Davis, California. Two cultivars were obtained from commercial nurseries and the three heirloom varieties through a local source.

1. 'Sin Pepe': yellow/pink rind, light pink to light red aril, very soft seed, sweet flavor, from Southern California
2. 'Fleischman's': light yellow/ pink rind, light pink to light red aril, soft seed, sweet flavor, from California
3. 'Azadi': mostly white rind, pink aril, soft seed, sweet flavor, from Turkmenistan
4. 'Medovyi Vahsha': red rind, red aril, soft seed, sweet flavor, very productive trees, from Turkmenistan
5. 'Sogdiana': red rind, red aril, soft seed, sweet flavor, from Turkmenistan
6. 'Sirenevyi': tan to red rind, red aril, soft seed, complex, sweet flavor, from Turkmenistan
7. 'Gissarkii Rozovyi': yellowish to red rind, light red aril, soft seed, good balanced flavor, from Turkmenistan
8. 'Myagkosemyannyi Rosovyi': yellow/pink rind, pink aril, soft seed, good flavor, from Turkmenistan
9. 'Pamyati Rozanov': red rind, red aril, soft seed, good balanced flavor, from Turkmenistan
10. 'Parfianka': red rind, red aril, soft seed, good flavor balance, from Turkmenistan
11. 'Desertnyi': tan to red rind, red aril, soft seed, good flavor balance (strong citrus notes), from Turkmenistan
12. 'Vkusnyi': red rind, red aril, soft seed, good flavor balance, from Turkmenistan
13. 'Ariana': red rind, red aril, soft seed, good flavor balance. Reportedly good in the heat, from Turkmenistan
14. 'Molla Nepes': red rind, reds aril, soft seed, good flavor but tends to be a bit tart, from Turkmenistan
15. 'Wonderful': red rind, red aril, med. seed, good flavor (standard variety), from California
16. 'Palermo': red rind, red aril, med. seed (similar to 'Wonderful'), good balanced flavor, from California
17. 'Cranberry': red rind, red aril, crunchy seed, good balanced flavor, from California
18. 'Purple Heart': red rind, red aril, med. crunchy seed, good flavor, good production, from California
19. 'Kara Bala Miursal': red rind, red aril, med-hard crunchy seed, very productive, from Soviet Union
20. 'Nikitski Ranni': red rind, hard seed, good balanced flavor, very productive tree, from Soviet Union
21. 'Syunt': Excellent, large, sweet, fruit has soft seeds, with white juice and arils, from Turkmenistan
22. 'Sverkhramniy': The name translates as "super early". Fruit can ripen in early August, from Turkmenistan
23. 'Ruby': (this is not 'Ruby Red') a red pomegranate found near the ghost town of Ruby in southern Arizona. Heirloom variety donated from Kino project.
24. 'Josefina': A white pomegranate from Southern Arizona, extremely sweet with white fruit. Heirloom variety donated from Kino project.

25. 'Sosa Carillo': a delicious soft-seed pink pomegranate that appears to have been originally grafted onto a white pomegranate, planted in 1880's in Tucson. Heirloom variety donated from Kino project.
26. 'Angel Red': commercial cultivar, early, soft seeds, dark red exterior and interior color, from Southern California
27. 'Wonderful': commercial cultivar, dark red interior and exterior, industry standard, from California
28. 'Haku-botan': Japanese ornamental variety with greenish white rind, white double flowers. Fruit and juice are tart.
29. 'Haku-taka': Ornamental variety from Japan with double flowers.
30. 'Ki-Zakuro': Japanese ornamental variety with pink and white double flowers
31. 'Nochi-shibori' : Japanese ornamental variety with red double flowers
32. 'Toryu-shibori' : Japanese ornamental variety with salmon-colored double flowers and yellow fruit

### ***Propagation***

Pomegranates are easily propagated through cuttings that are taken either in winter when plants are dormant (hardwood cuttings) or in early summer when they are actively growing (softwood cuttings). The majority of plants were cultivated through hardwood cuttings and some through softwood cuttings. Cuttings were grown under mist in a greenhouse until well rooted. Then they were transplanted into containers and starting in spring 2012 into the fields at the three locations.



Location of trials

### ***Cultivation***

Plants are pruned in late winter when they are still dormant. Three to five stems are maintained and sucker growth from the base is removed. Plants in Bowie and Tucson are irrigated with subsurface drip irrigation, those in Yuma with flood irrigation.

## **Results**

Evaluation includes plant size, time of bud break and flowering, fruit weight, size, and number, fruit color, juice quality, and fruit quality.

Plant survival was 98% in Yuma, 99% in Tucson and 88% in Bowie. In Tucson some plants were damaged by strong spring winds which caused some stems to break at the base requiring later removal.

Bud break and first flowering differed between cultivars and location with the Yuma location earliest and the Bowie location latest.

### ***Budbreak***

Yuma: 2/5-3/19 (2013), 1/24-2/28 (2014),

Tucson: 2/22-3/22 (2013), 2/4-3/4 (2014)

Bowie: 3/21-4/22 (2013), on 2/25 (2014) 42% of plants had less than 10% leaf cover, one quarter of trees had 25% leaf cover and the remaining 20% of live plants had more than half to full leaf cover.

### ***Flowering***

Yuma: 3/12-4/23 (2013), 3/7-3/25 (2014)

Tucson: 4/1-5/7 (2013), 3/14-3/28 (2014)

Bowie: on 4/22 (2013) 22% of all plants were flowering, the remainder did not have flowers yet.

### ***Yields***

In Tucson, largest yields were collected both in 2013 and in 2014 although the 2013 yields were much smaller. In 2014, 'Purple Heart' yielded about 14 kg, 'Wonderful' 10 kg, and 'Josefina' a local heirloom cultivar, yielded 9 kg from the four trees at the study site. Highest yields in Yuma were about 5 kg for 'Purple Heart' and 'Sosa Carrillo'. In Bowie, 'Sosa Carrillo' and 'Azadi' had the most marketable fruit, about 4 kg. Analysis of the fruit quality showed that fruit from Bowie had the darkest red juice color, and fruit from Yuma had the lightest color, appearing pink rather than dark red.

Evaluation of the 32 cultivars is continuing in order to select the best cultivars for each site.

## **Problems**

In general pomegranates do not have many problems in arid climates. We encountered the following in our study: sunburn, fruit rot, fruit splitting, animal predation from rodents and birds, wind damage and leaf footed plant bugs. Some young plants in Bowie sustained light damaged

by freezing temperatures which typically drop into the low 20 degree Fahrenheit range (-4.4 to -6.6°C). Older plants are usually not affected.

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Bud break differs between cultivars and locations



Nochi Shibori (red) Haku-botan (white) and Toryu Shibori (salmon) are ornamental cultivars with double flowers



Edible pomegranate cultivar at flowering



Fruit ripening



Tucson site 2014



Harvest





Leaf footed plant bug



Fruit rot



Fruit splitting



Sunburn