Jeff Moersfelder

Pomegranates: Vegetative Propagation and an Overview of the USDA – Davis, National Clonal Germplasm Repository Collection
Topics of Discussion

• My background
• Vegetative propagation
• Overview of the collection at the USDA, ARS Davis, NCGR
• Fruiting types
• Ornamental types
• Questions
My History at the Repository

• 1992: Began working for the NCGR through the Pomology Department as a student at UC Davis.
• 1994: Graduated with a B.S. in Biology and was hired by the USDA / ARS Davis, NCGR as the Assistant Field Manager.
• 1998 Promoted to Greenhouse/Nursery Manager.
• 2001: Appointed Pomegranate Point Person by then curator Dr. Chuck Simon.
Vegetative Propagation of Pomegranate
Dormant Cuttings
Rooting Hormone

- I use 0.2% NAA Rootone or Dip’n Grow diluted to 1,000ppm IBA + 500ppm NAA
Rooting Media

- 1:1 by volume vermiculite and perlite
Mist Bed Set Up
Bottom Heat (75-80 F)
Intermittent Mist
Cuttings Ready for Potting
(Mar-08-2008 to May-24-2008)
Post Potting Mist
Potting Media
Peatmoss, Perlite, Supersoil
(1:1:1:1 by volume)
Pest Problems
Overview of the Pomegranate Collection
The History of the Pomegranate Collection  (210 accessions from 11+ countries)

- **50+ years ago** the trees that make up the “old block” C came from the Chico Plant Introduction Station to WEO.
- **Pre 1990** “new block” A was planted with 5 (mostly ornamental accessions): **DPUN0001-0005**
- **1990** received 5 ornamental Japanese varieties: **DPUN0007-0011**
- **1995** received 7 varieties collected from the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala by then Curator Dr. George White and Dr. Dan Parfitt: **DPUN0013-0019**
- **1996** received 19 accessions of various backgrounds from Todd Kennedy: **DPUN0022-0040**
- **1996 + 1997** received 15 accessions from John LaRocca and John Chater: **DPUN0041-0045 and DPUN0048-0057**
- **1997** received 22 accessions from Michael Hotchkiss in Byron Georgia. 17 originally came from Turkmenistan and 5 from the Safiabad Research Center in Iran. **DPUN0059-0080**
- **1997** Todd Kennedy and Dr. George White went through “old block” and assigned accession numbers to 13 trees based on Dr. John Lovell Fruit Gardener article: **DPUN0081-0092 +DPUN0167**
- **1999** received 65 accessions from Dr Gregory Levin at the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala with cooperation from Dr. William R. Feldman at the Boyce Thompson Southwestern Arboretum: **DPUN0099-0163**
- **2006** received accessions from Georgia and 11 from Armenia collected by then Curator Dr. Ed Stover and Joseph Postman: **DPUN0175-0190**
- **2006** received 5 accession with various backgrounds from David Silverstein: **DPUN0193-0197**
- **2007** received 5 accessions from India from Dr. Dharam Sharma: **DPUN0298-0202**
- **2007** received 16 accessions from Azerbaijan collected by Dr. Malli Aradhya: **DPUN0207-0222**
Pomegranate Distribution
Pomegranate Distribution Over the Last 14 Years

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Pomegranate Tasting
November 8th 2008
Preparation of Pomegranates for Tasting
Aril Characteristics

DPUN 0007 ‘Haku Botan’
DPUN 0082 ‘Sin Pepe’
DPUN 0107 ‘Gissarskii Rozovyi’
DPUN 0056 ‘Purple Heart’
Fruit Development of DPUN 0015 ‘Parfianka’
Male and Female Flowers
Male and Female Flowers
Male and Female Flowers - Split
Soft Seeded Types
DPUN 0082 ‘Sin Pepe’

- This variety originally came to the Davis repository from the Chico, California plant introduction station. It also goes by the names “Pink Ice” and “Pink Satin”.
- This is a sweet type with medium sized fruit, pink speckled rind, medium sized light pink to rose colored arils, with extremely soft seeds. Good for fresh eating, with sweet mild fruit flavor that is best if fruit are left on the tree until October even though they are ripe earlier.
- Fruit harvested on October 10th, 2006 had Brix = 16.5, TA = 0.3% (tataric acid).
This variety came from Dr. Gregory Levin when he was stationed at the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala. Its name means “honey”.

It is a sweet type with medium sized fruit, pink/red rind, medium sized dark red arils, with extremely soft seeds. Good for fresh eating, with a sweet mild fruit flavor. It is particularly desirable due to its combination of being sweet, soft seeded and pink/red.
DPUN 0151 ‘Sirenevyi’

- This variety came from Dr. Gregory Levin when he was stationed at the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala.
- This is a sweet type with medium to large sized fruit, with tan, blushed in pink rind, medium sized dark red arils, with soft seeds. It is a late variety that is good in October but best in flavor and color in early November. It is excellent for fresh eating with a complex flavor. It has done very well at taste tests.
- Fruit harvested on October 28th, 2008 had Brix = 15.2, TA = 0.22% (citric acid).
DPUN 0015 ‘Parfianka’

- This variety came from Dr. Gregory Levin when he was stationed at the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala. Levin named this variety based on the name of the ancient oriental empire, Parfijia, located where Garrygala now stands.

- It is a sweet-tart type, with medium to large sized fruit, red rind, medium large sized dark red arils, with very soft seeds. It has an excellent balance of flavor. It has consistently done very well at taste tests and is excellent for fresh eating or juice.

- Fruit harvested on October 21st, 2008 had Brix = 15.23, TA = 1.04% (citric acid).
DPUN 0107 ‘Gissarskii Rozovyi’

- This variety came from Dr. Gregory Levin when he was stationed at the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala.

- It is a sweet-tart type, with good balanced flavor and medium to large sized fruit. Pink and yellow rind with medium large arils and soft seeds.
DPUN 0139
‘Myagkosemyannyi Rosovyi’

- This variety came from Dr. Gregory Levin when he was stationed at the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala
- It is a sweet-Tart type, with good flavor and medium to large sized fruit. Pink and yellow rind with medium large arils and soft seeds. Citrus flavored (grapefruit).
DPUN 0125 ‘Ariana’

- This variety came from Dr. Gregory Levin when he was stationed at the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala.
- It is a sweet-Tart type, with great flavor and medium to large sized fruit. Red rind with dark red arils and very soft seeds.
- Produced very large, balanced flavored fruit in 2008. Top performer in 2008 (very hot fall).
DPUN 0128 ‘Molla Nepes’

- This variety came from Dr. Gregory Levin when he was stationed at the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala.

- It is a sweet-Tart type, with great flavor and medium to large sized fruit. Red rind with dark red arils and very soft seeds.
Medium Soft to Medium Seeds

“Tweener” Types
Fresh Eating or Juice
DPUN 0081 ‘Wonderful’

- California industry standard variety.
- It is a sweet-tart type with medium to large sized fruit, red rind, medium sized dark red arils, medium soft seeds and a definite astringency giving it a wine like character. It has excellent flavor and color. It is good for fresh eating and for juice.
DPUN 0056 ‘Purple Heart’

- Developed by John Chater in Camarillo, California.
- It is a sweet to sweet-tart type with medium to large fruit, red rind, medium to large sized dark red arils, and medium soft to medium seeds. It has good fruit flavor and color. It is good fresh eating and for juice.
- Minimal splitting and excellent holding ability off the tree.
- Fruit harvested October 28th, 2008 had Brix = 15.8, TA = .92% (citric acid).
DPUN 0167 ‘Ink’

- This variety originally came to the Davis repository from the Chico, California plant introduction station. It is from our “old block”.
- It is a sweet-tart type with medium to large sized fruit, dark red rind, medium sized arils, with medium seeds. Good flavor.
- Shared best pomegranate rating in 2008 with ‘Ariana’
DPUN 0066 ‘Kara Bala Miursal’

- This accession came to the Davis repository from the USDA/ARS Southeastern Fruit and Tree Nut Research Lab in Byron, Georgia form Michael Hothchkiss. Originally from Azerbaijan.

- This is a sweet-tart type with medium to large fruit, speckled pink/red rind, medium-large sized dark red arils, with medium seeds that “pop” when you chew them. Good fresh eating with jam like flavor but probably best for juice due to harder seed.
Medium Hard to Hard Seeds

Juice Types
DPUN 0059 ‘Sakerdze’

- This accession came to the Davis repository from the USDA/ARS Southeastern Fruit and Tree Nut Research Lab in Byron, Georgia from Michael Hothchkiss. Originally from Georgia.

- It is a sweet-tart to tart type with medium to large fruit, red rind, medium to large sized dark red arils, and hard seeds. It has good fruit flavor and color and seems to be quite productive. Good for juice.
DPUN 0060 ‘Al Sirin Nar’

- This accession came to the Davis repository from the USDA/ARS Southeastern Fruit and Tree Nut Research Lab in Byron, Georgia form Michael Hothchkiss. Originally from Azerbaijan or Turkmenistan.

- This is a sweet-tart type with large fruit, red rind, large sized dark red arils, and very hard seeds. It has good fruit flavor with citrus/floral notes and excellent color. This variety is very productive from a young age and is best suited to juice.
DPUN 0155 ‘Kara Gul’

- This variety came from Dr. Gregory Levin when he was stationed at the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala.

- It is a sweet-Tart type, with good flavor and medium to large sized fruit. Dark red rind with dark red arils and medium hard seeds.

- Darkest variety in collection. Name means dark red / black flower.
Spice Type
DPUN 0027 ‘Daru’

- This variety came to us from Todd Kennedy in 1996. It is native to western Himalayas.
- Small, tart fruit with yellowish/green covered with red rind. Small dark red to pinkish white arils.
- Used for making the spice anardana.
Ornamental Varieties

DPUN 0007 ‘Haku Botan’

DPUN 0009 ‘Ki Zakuro’

DPUN 0017 ‘Dotch Legrelley’

DPUN 0011 ‘Toryu Shibori’
DPUN 0001
‘Double Red White’
Came into the collection pre 1990
DPUN 0001 ‘Double Red White’
DPUN 0009 ‘Ki Zakuro’

This accession was collected by the National Arboretum from the Shibamichi Nursery in Saitama, Japan in November of 1985. The Davis, NCGR received this accession June of 1990.
DPUN 0011 ‘Toryu Shibori’

This accession was collected by the National Arboretum from the Shibamichi Nursery in Saitama, Japan in November of 1985. The Davis, NCGR received this accession June of 1990.
This accession was collected by the National Arboretum from the Shibamichi Nursery in Saitama, Japan in November of 1985. The Davis, NCGR received this accession June of 1990.
DPUN 0010 ‘Nochi Shibori
This variety came from Shibamichi Nursery in Saitama, Japan. It is grown primarily for its highly ornamental double white flowers.

It is an extremely tart type, with medium to large sized fruit, yellow rind, medium sized clear to yellow tinted arils, with hard seeds. It is bracingly tart but mellows after some time in the refrigerator. Its flavor is lemon-like with a hint of “pineapple lifesaver”. It is good in a juice blend when more acidity is desired.

Fruit harvested on October 21st, 2008 had Brix = 15.7, TA = 2.09 (citric acid).
DPUN 0007 ‘Haku Botan’
DPUN 0017 ‘Dotch Legrelley’

This accession was collected September of 1995 by Dr. George White and Dr. Dan Parfitt from the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala. It was developed and selected prior to 1995 in Azerbaijan by A.D. Strebkova.
DPUN 0017 ‘Dotch Legrelley’
This tree is part of the “old block” of pomegranates west of the vineyard at the Wolfskill Experimental Orchard. This tree originally came from the Chico, CA Plant Introductory Station.
WEO 42
DPUN 0019
‘(C)Hydranar X Kirmizy Kabuh’
This accession was collected September of 1995 by Dr. George White and Dr. Dan Parfitt from the Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala. It was developed and selected prior to 1995 in Baku, Azerbaijan. The tree is semi-dwarf (1 – 2m tall) and is the result of a cross between mutant of American dwarf Chico X Kirmizy-Kabuh.
Thank You !!!

Question Time