

Peach Rootstock

Trials

Jim Schupp

PSU-FREC



System Components

- ⦿ Genetic
 - Variety
 - Rootstock
- ⦿ Tree arrangement
- ⦿ Tree spacing
- ⦿ Training
- ⦿ Pruning

Missing Key: Dwarfing Rootstock

- ⦿ High survival
 - Winter hardy
 - Well adapted / tolerant
 - Graft compatible
- ⦿ Productive / yield efficient
- ⦿ Large fruit size
- ⦿ Tree size control
- ⦿ Free from weaknesses
 - Rootsuckers
 - Poor anchorage
 - Disease / nematode susceptibility

Missing Key: Dwarfing Rootstock

- ◎ Dwarfing stocks remain a long-term goal
- ◎ To-date, many are interspecific hybrids
- ◎ When size control is achieved:
 - Tree often appears stressed (incompatibility)
 - Fewer and/or small fruit
 - No increase in biological efficiency
 - Survival issues

2008 Peach Rootstock Trial

- Johnboy on 9 rootstocks
- Commercial standard = Bailey
- FREC Biglerville: Open Vase
- PSU Rock Springs: in-row V
- Two commercial grower locations
 - 1 open vase, 1 perpendicular V

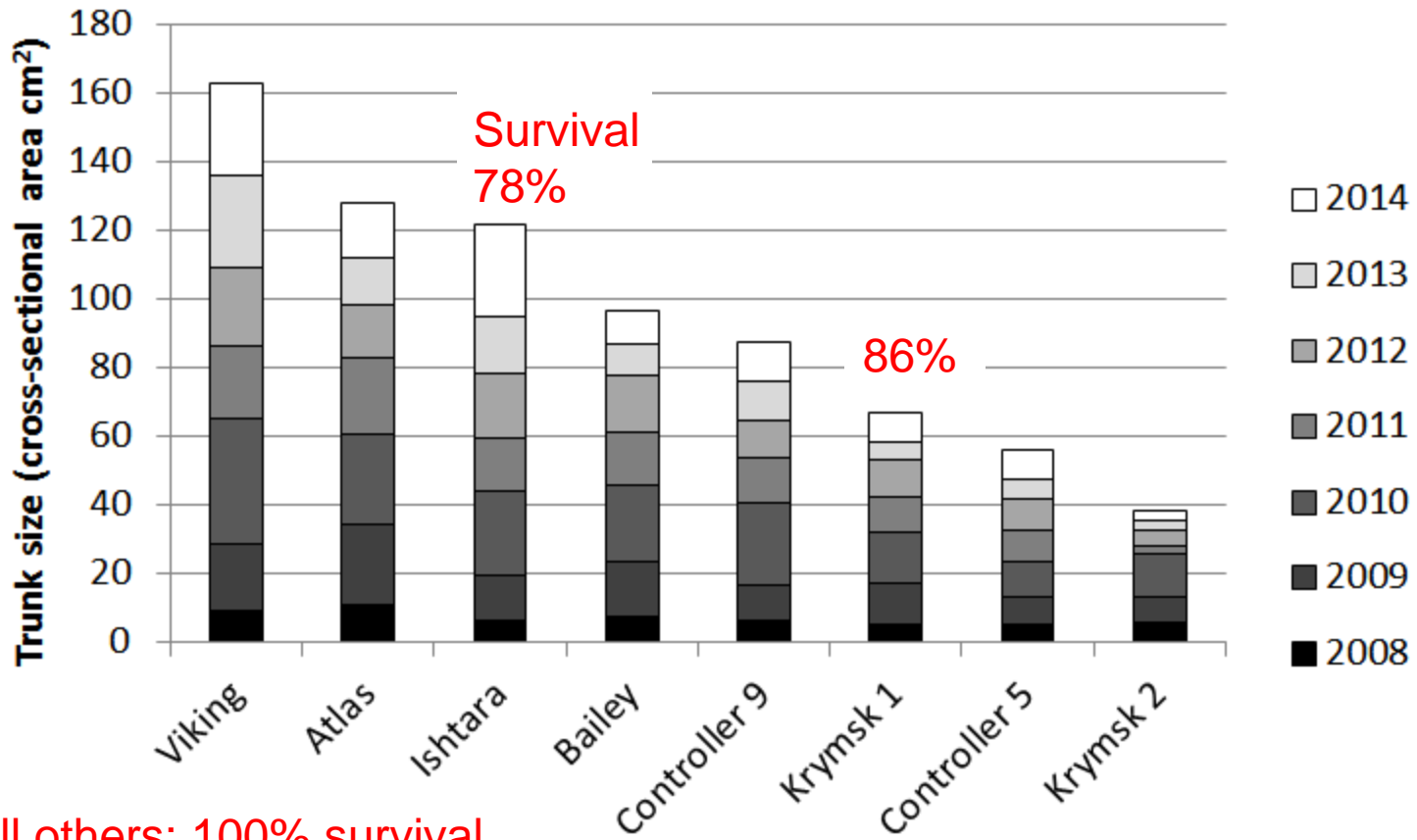
2008 Rootstocks at FREC

Rootstock	TCSA	% Bailey	Cumul. Yield (lb)	Yield Effic.	Mort. (%)
Krymsk 2	72	45	130	0.82	50
Krymsk 1	91	57	216	1.07	70
Controller 5	131	82	243	0.84	10
Ishtara	138	87	278	0.91	70
Bailey	159	100	401	1.14	10
Atlas	185	116	328	0.80	20
Controller 9	192	121	309	0.73	10
Empyrean 2	195	123	282	0.66	20
Viking	214	135	342	0.72	30

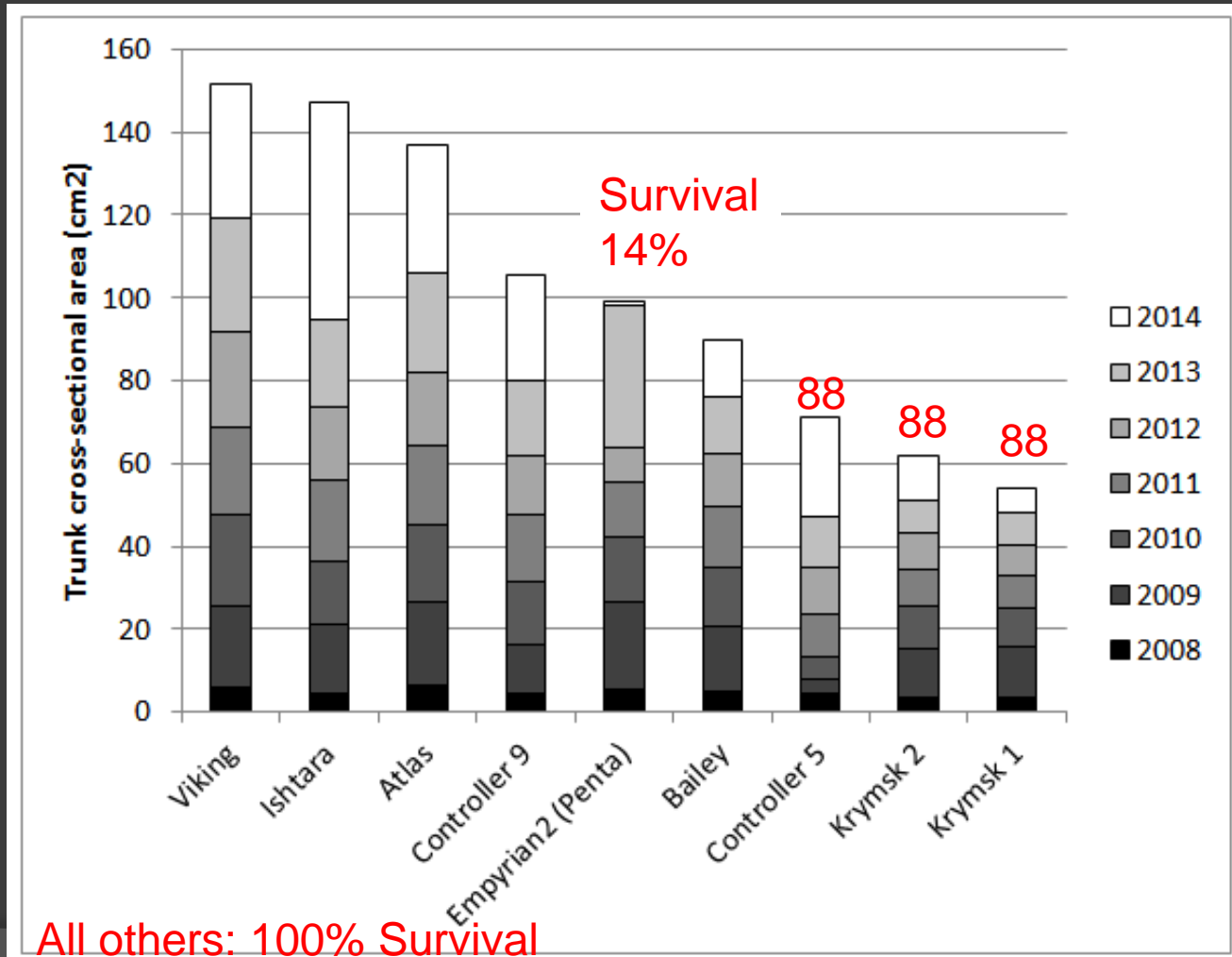
2008 Rootstocks Yield > 2.75 inches

Rootstock	2011	2012	2013	2014
Krymsk 2	1	18	3	15
Krymsk 1	12	49	27	28
Controller 5	6	30	58	56
Ishtara	14	60	40	62
Bailey	7	79	71	86
Atlas	13	67	65	73
Controller 9	14	51	70	80
Empyrean 2	12	52	52	55
Viking	10	60	71	62

2008 Lory Planting



Schatzer Farm Planting



2008 Plantings

- The winner is... Bailey!
- High yield, YE, Yield of large fruit
- Low mortality
- Slight degree of tree size control

2009 NC-140 Peach Trial

- Redhaven on 17 rootstocks
- Commercial standard = Lovell
- Trained to open vase system
- Supplemental irrigation during final swell

2009 NC-140 Full Sized Rootstocks

Rootstock	TCSA	% Lovell	Cumul. Yield (lb)	Yield Effic.	Mort. (%)
Guardian	138	95	175	0.58	0
KV 10127	143	99	176	0.56	0
Bright's Hybrid#5	144	99	176	0.56	13
Lovell	145	100	198	0.62	0
Krymsk 86	153	106	175	0.52	0
Atlas	160	111	203	0.59	13
Viking	163	113	203	0.57	25

NC-140 Vigorous Rootstocks

Average Fruit Size (g)

Rootstock	2011	2012	2013	2014
Guardian	150	212	176	191
KV 10127	148	163	165	189
Bright's Hybrid#5	148	185	171	194
Lovell	145	176	161	182
Krymsk 86	147	183	185	199
Atlas	152	196	170	204
Viking	145	182	180	192
Guardian	150	212	176	191

2009 NC-140 Full Sized Rootstocks

- 6 rootstocks were similar size to Lovell
- Similar yield and yield efficiency
- Good survival, except Viking (75%)

Guardian®

- Developed to tolerate PTSL in South
- Tree size 95% of Lovell
- Survival in PA is 100%
- Preliminary verdict:

Interchangeable with other std size stocks

2009 NC-140 Size-controlling Rootstocks

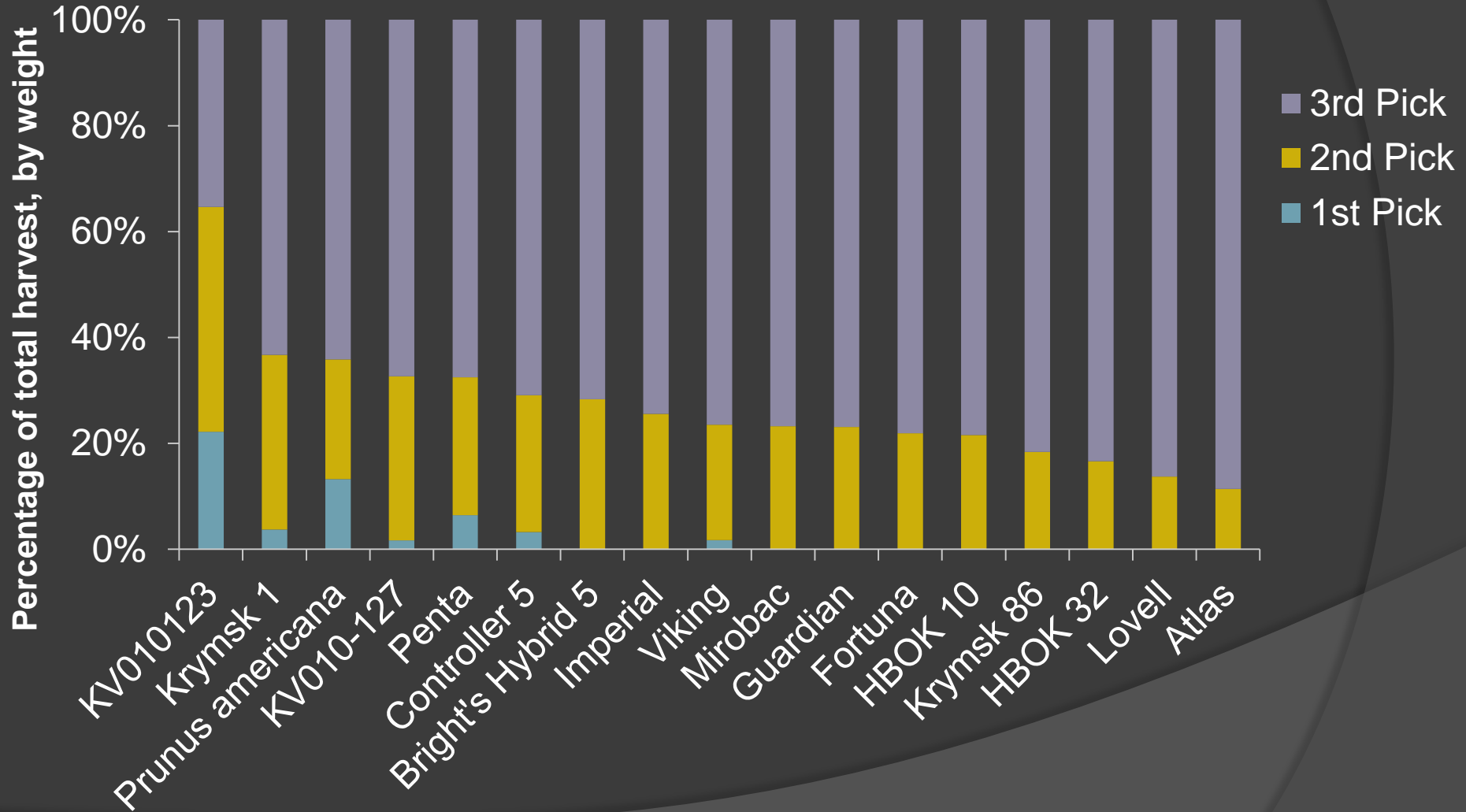
Rootstock	TCSA	% Lovell	Cumul. Yield (lb)	Yield Effic.	Mort. (%)
Krymsk 1	63	44	94	0.68	50
P. americana	87	60	152	0.80	0
Controller 5	90	62	135	0.68	0
Fortuna	99	68	139	0.66	38
HBOK 10	101	70	190	0.88	0
Empyrean 2	111	76	134	0.56	13
HBOK 32	115	79	168	0.66	13
Mirobac	120	83	166	0.62	0
KV 10123	127	88	200	0.70	0

NC-140 Size Controlling Rootstocks

Average fruit size (g)

Rootstock	2011	2012	2013	2014
Krymsk 1	146	180	181	177
P. americana	150	199	173	178
Controller 5	151	190	182	180
Fortuna	139	209	158	164
HBOK 10	151	196	160	174
Empyrean 2	147	181	163	165
HBOK 32	145	179	148	169
Mirobac	148	182	175	178
KV 10123	159	195	157	179

2011 Harvest Timing



2009 NC-140 Size-controlling Rootstocks

- ◎ Nine stocks give some tree size control
- ◎ One (Controller 5) is discontinued
 - anchorage
- ◎ Two (Krymsk 1 & Fortuna) have unacceptably high mortality
 - In PA and in other NC-140 plantings

Prunus americana – American Plum

- ⦿ Among the most dwarfing:
 - Tree size 60% that of Lovell
- ⦿ Precocious
- ⦿ High yield efficiency (2nd to HBOK 10)
- ⦿ Suckering is excessive



**Prunus
americana**

HBOK 10 – Controller™ 8

- ⦿ Harrow Blood x Okinawa cross
 - *P. persica* cross from UC Davis
- ⦿ A small semi-dwarf: 70% Lovell
- ⦿ High cumulative yield
 - Similar yield to trees on standard rootstocks
- ⦿ Yield efficiency (1st)
- ⦿ Precocious
- ⦿ Mortality = 0



**HBOK 10 –
Controller 8**

HBOK 32 - Controller™ 7

- Another *P. persica* from UC Davis
- Tree size 79% that of Lovell
- Precocious
- Good cumulative yield and average yield efficiency



**HBOK 32 –
Controller 7**

KV 10123

- ⦿ Largest of the “semi-dwarfs”
 - 88% size of Lovell
- ⦿ Precocious
- ⦿ High yielding
- ⦿ *P. persica* cross from R. Scorza’s breeding program at USDA, Kearneysville, WV



KV 10123

Cumulative Mortality in Biglerville, 2014

Rootstock	Year of Planting	Mortality (%)
Fortuna	2009	38
Ishtara	2008	70
Krymsk 1	2008 & 2009	50 & 50
Krymsk 2	2008	40
Imperial California	2009	100
Viking	2008 & 2009	30 & 25

Tree Mortality

- ◎ Most trees died within 1 year of planting
 - Cause: Winter injury
- ◎ Exceptions:
 - Viking: a few over last 3 years
 - Ishtara: some early and some later!
 - Cause: winter injury + cytospora canker

Conclusions

- ◎ Several promising new rootstocks with a range of tree size control
 - Good survival, productivity and free of flaws
 - Some are *P. persica* (HBOK 10 & 32, KV 10123, Guardian): less risk of incompatibility
- ◎ Reason for some optimism that we may soon have the missing key!

Thanks For Your Support!



- Pennsylvania Peach & Nectarine Board
- SHAP Research Committee

