

UNDERSTANDING SEGREGATION DISTORTION AND REPRODUCTIVE BARRIERS TO IMPROVE TRANSFER OF TRAITS FROM *SOLANUM PENNELLII* TO CULTIVATED TOMATO



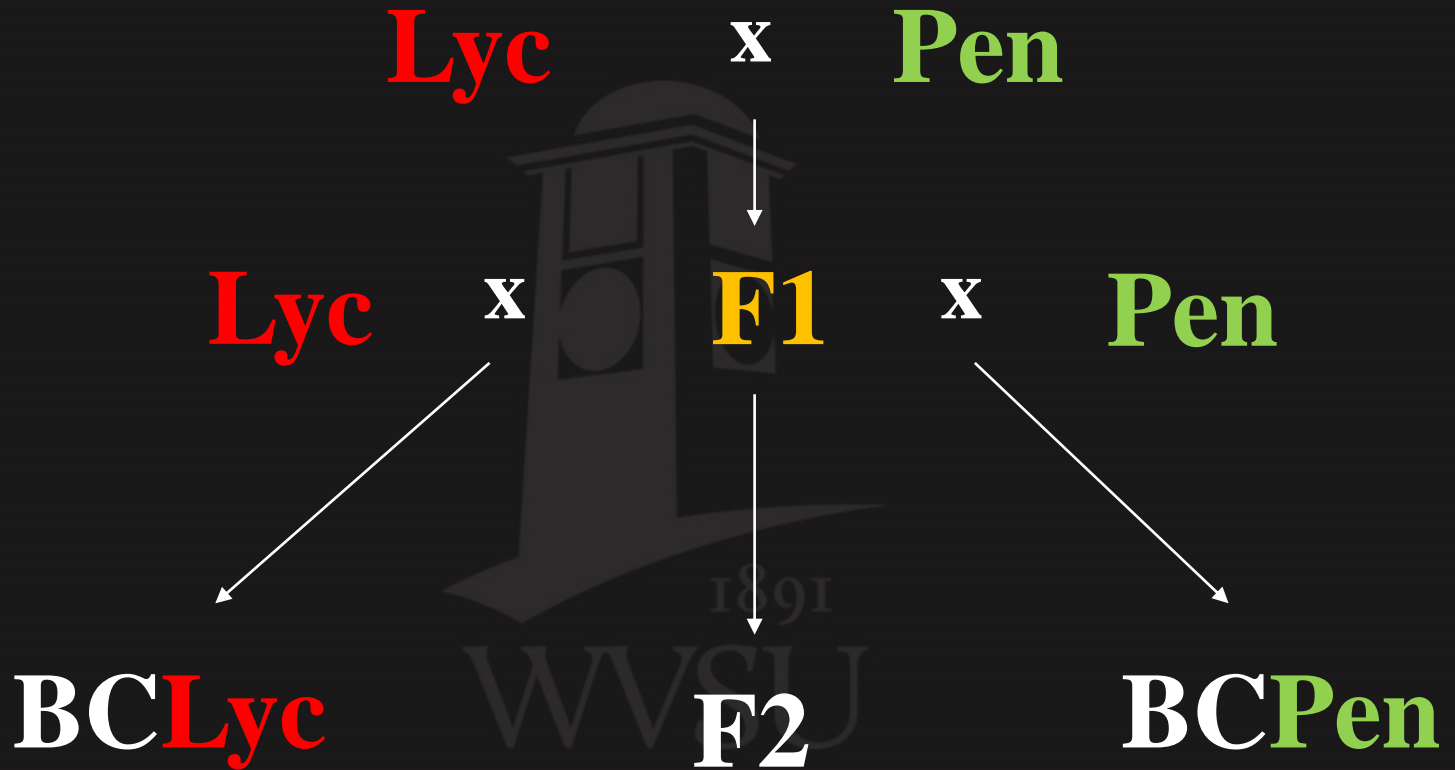
Barbara E. Liedl
Associate Professor

Challenges in Transferring Traits from Wild Species

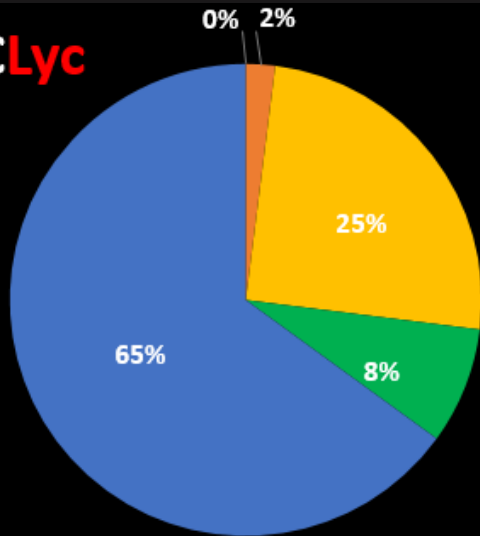
- Polygenic inheritance of the trait
- Linkage drag
- Interspecific and intraspecific crossing barriers
- Hybrid breakdown and segregation distortion



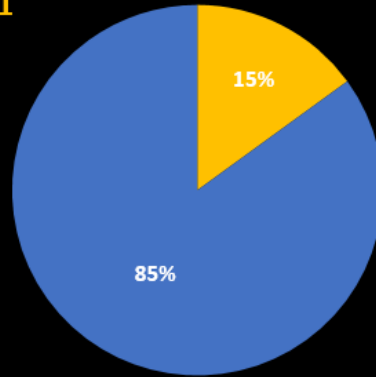
Pen F_1 Lyc
(Lyc x Pen)



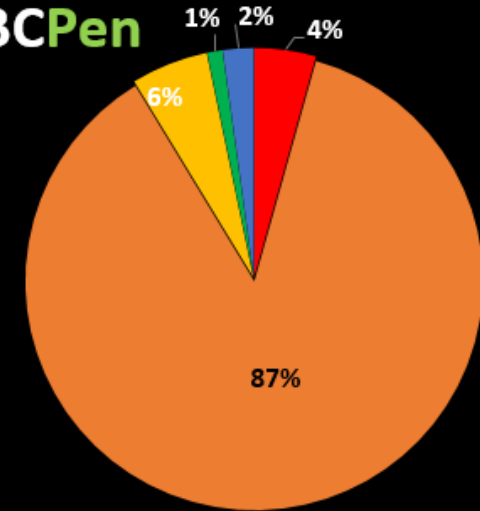
BC_{Lyc}



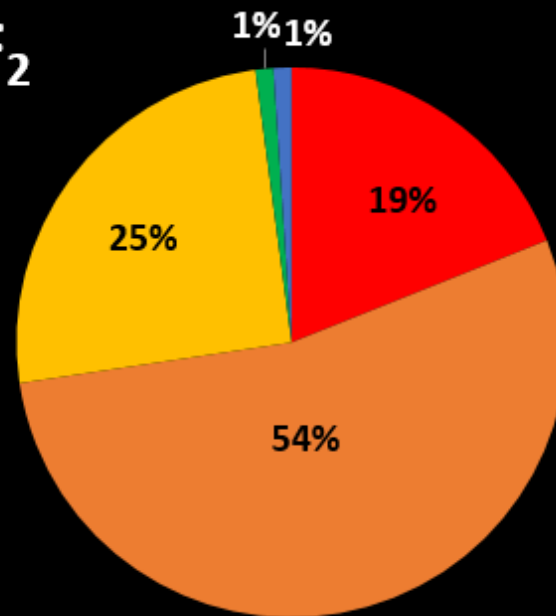
F₁



BC_{Pen}



F₂



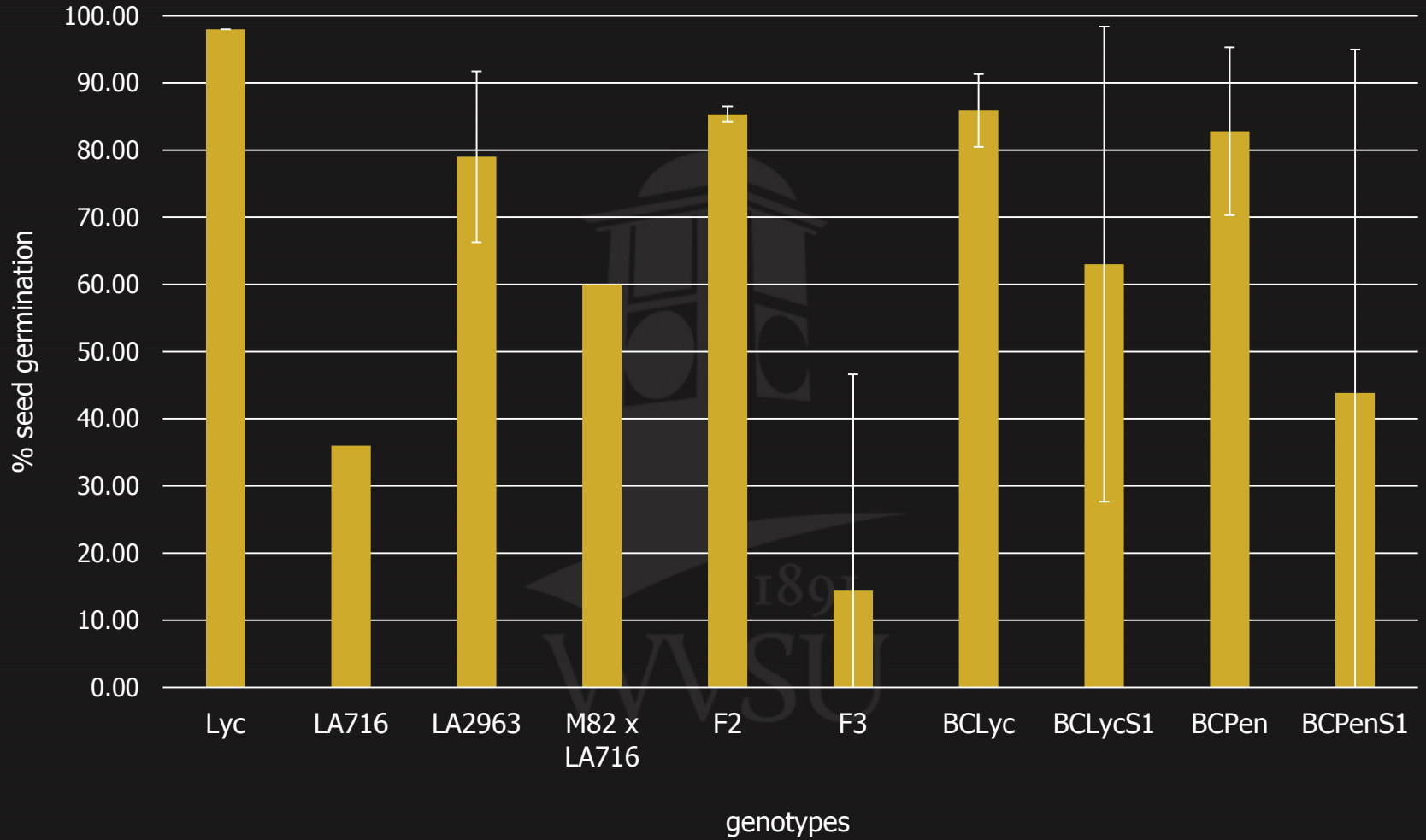
- Never flowered
- No fruit produced
- Fruit but no seed (parthenocarpic)

- Seed not germinable
- Seed germinate (fecund)

Pollen Stainability

	Lyc	Pen	F1	F2	BCLyc	BCPen
Ave	99.22	16.31	85.7	31.7	57.9	48.9
SD	0.57	11.46	3.1	25.6	24.3	24.6
Min	98.65	4.3	80.1	0.0	1.5	4.3
Max	100	29.7	91.6	99.2	97.5	95.5

Seed Germination with StDev



Segregation distortion in F_2 populations



Liu et al 1995

1891
WVSU

Chrs	% BCLyc skewed	% BCPen skewed	% F2 skewed
1	100.00	0.00	82.69
2	50.00	2.17	44.68
3	97.67	88.89	86.67
4	54.10	27.59	6.45
5	16.00	17.78	7.69
6	9.80	22.45	53.85
7	94.00	3.85	9.26
8	100.00	40.00	5.36
9	70.37	29.41	3.64
10	83.33	3.92	100.00
11	5.26	21.82	63.16
12	91.30	6.38	68.09
Total	63.37	21.93	42.99

Summary

- BCLyc population is the best hope for transferring traits based on the production of germinable seed from this population
- Segregation distortion was the worst in the BCLyc population – total and entire chromosomes
- Analysis is continuing and suggestions are requested

Acknowledgements

