Welcome to the Webinar! This webinar will start at the top of the hour and it will be recorded. Please find a handout of the slides in the "handouts" section of your webinar control panel. Find the other 2 webinars in this series on the Plant Breeding and Genomics YouTube channel at https://www.youtube.com/user/plantbreedgenomics/videos

Getting Started with Barcode-based Digital Data Collection for Vegetable Breeding Programs Part 3 of 3: Planting to Field Observations

Michael Mazourek Calvin Knoyes Keeney Associate Professor of Vegetable Breeding Cornell University



National Institute of Food and Agriculture

workflow photographs by Emily Rodekohr

Genomic And Phenomic Tools To Support Vegetable Cultivar Development: Winter Squash As An Initial Target USDA-AFRI 2013-67013-21232

United States Department of Agriculture

Our Goals

- 1. Efficiency and accuracy
 - No transcription or transcription errors
 - No funded downtime in the winter to "type it up"
- 2. Security and availability
 - No risk of losing only copy or pages
 - Viewable by whole team anywhere, anytime
- 3. Understand progress during the season
 - Plot your data as it comes in

Getting Started with Barcode-based Digital Data Collection for Vegetable Breeding Programs Part 3 of 3: Planting to Field Observations

USDA

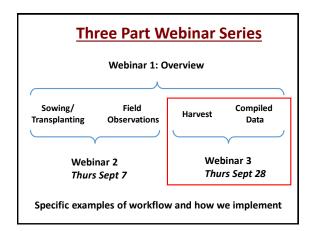
Michael Mazourek Calvin Knoyes Keeney Associate Professor of Vegetable Breeding Cornell University

workflow photographs by Emily Rodekohr

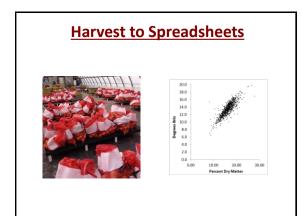


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United States National Institute Department of Food and Agriculture Agriculture

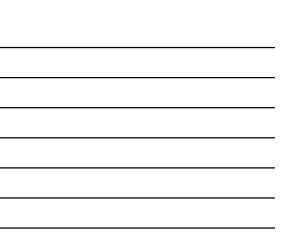




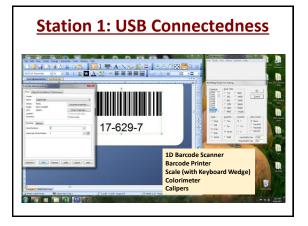




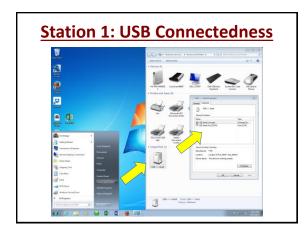








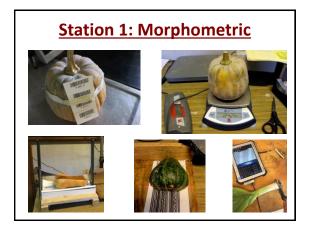












Station 2: Imaging



Worklights with 5,000K CFL bulbs Tripod DSLR camera Grey linoleum White milkboard Ruler for scale Sponge & bucket



Station 2: Imaging

Adjust height and zoom to get desired area in view
 Tape lens

1

 Set white balance • WB mode

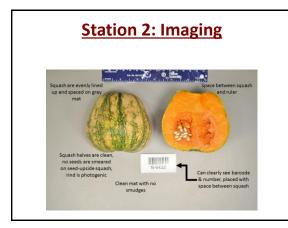


Set exposure

Custom

- Aperture priority mode "A" Aperture priority mode "A"
 Set F stop to higher number (small opening and large depth of field)
 Grey card with your exact zoom and light settings to fill viewfinder or use spot metering
 Depress shutter halfway and note shutter speed
 Switch to manual media and onter Exten and shutter speed

- Switch to manual mode and enter Fstop and shutter speed
- Tape dials





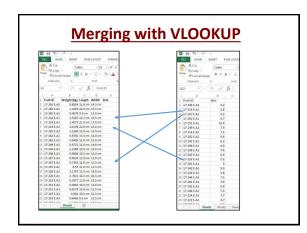
Station 4: Dry Matter Process



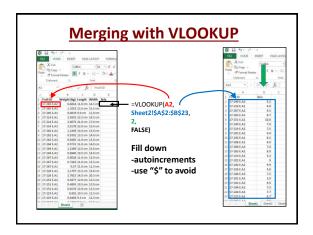
How Many Barcode Stickers?

- Brix inside freezer baggie
- Dry matter with weighboat (scanned twice)
- Photo internal label, reused
- Seed through dryer to packet (inside and outside)
- Taste test

5 stickers consumed, replaces 6 handwritten labels







Merging with VLOOKUP

12:36:42 0.5711 L10:m 14.6 m PN/A 12:36:45:41 0.3886 35:0m 14.6 m PN/A 12:36:42 0.2781 14:0m 13.5 m PN/A 12:36:42 0.2187 11:36 m 13.3 m PN/A 12:36:42 2.1371 13:5m 13:5m 25:0m PN/A 12:36:42 2.1371 13:5m 13:5m 25:0m PN/A 12:36:42 0.3171 12:0m 13:1m PN/A 12:36:42 0.3171 12:0m 13:1m PN/A 12:36:43 0.3571 13:0m 13:1m PN/A 12:331 14:41 0.3571 13:0m 13:1m PN/A 12:331 14:41 0.4571 13:0m 13:1m PN/A 12:331 14:41 0.4571 13:0m 13:1m PN/A 12:336 14:31 0.6571 13:0m 13:1m PN/A	ſ					LAV		FORMUL/	
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Data Load Carter Load		17-265 E.A2	0.8	814	11.0 cm	14.5	cm		
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D240 Lab. 0.9392 L33:em Medem L37 D240 Lab. 0.960 L3 0.960 m/MA D244 Lab. 0.9572 L14:em Malor M/A D244 Lab. 0.9571 L4:em Malor M/A D247 L42. 0.9571 L4:em Malor M/A D247 L42. 0.9571 L3:em Malor M/A D247 L42. 0.7571 Malor Malor M/A D347 L44. 0.7571 Malor Malor M/A D347 L44. 0.7571 Malor M/A <td></td> <td>17-214 E.A3</td> <td>2.6</td> <td>178</td> <td>22.0 cm</td> <td>15.0</td> <td>cm</td> <td>5.3</td> <td></td>		17-214 E.A3	2.6	178	22.0 cm	15.0	cm	5.3	
D3912.43 0.889 13.6m 13.6m M/A D3464.24 0.891 13.6m 14.6m M/A D3464.84 1.2919 13.6m 15.6m M/A D3464.84 1.2919 13.6m 15.6m M/A D3464.84 1.2919 13.6m 15.6m M/A D3474.84 0.2912 14.6m 13.6m M/A D3474.84 0.2911 13.6m 15.6m M/A D3474.84 0.2911 13.6m 15.2m M/A D3314.84 0.2917 12.6m 13.5m M/A D3314.84 0.2917 13.2m 13.2m M/A		17-262 E.A.2	1.2	349	13.0 cm	15.0	cm	#N/A	
12:364:42 0:5721 11:0701 14:070 PN/A 12:364:44 12:389 13:5701 35:070 PN/A 12:364:44 0:3886 35:070 14:070 PN/A 12:364:44 0:3886 35:070 14:070 PN/A 12:362:44 0:3886 15:070 13:070 PN/A 12:362:44 0:3886 15:070 13:070 PN/A 12:362:42 0:371 11:070 11:370 PN/A 12:362:43 0:371 11:070 11:370 PN/A 12:361:44 0:3871 12:080 13:370 PN/A 12:351:44 0:3871 12:080 13:370 PN/A 12:351:44 0:3871 13:080 13:320 PN/A 12:351:44 0:3871 13:080 13:320 PN/A 12:391:44 0:3871 13:080 13:320 PN/A 12:391:44 0:3871 13:080 13:320 PN/A 12:391:42 0:3811 13:510 13:320 PN/A		17-262 E.A1	0.5	992	13.5 cm	14.0	cm		
D2464 4.0 L289 D350m 3350m 497/4 D2464 4.0 D249 D450 497/4 D2467 4.0 D340 140 497/4 D3467 4.0 D340 140 497/4 D2467 4.0 D310 110 497/4 D2467 4.0 D310 110 497/4 D2467 4.0 D310 113 09 130 497/4 D310 140 4.0 D310 113 09 130 497/4 D311 4.0 D310 113 09 130 497/4 D311 4.0 D310 113 09 130 497/4 D311 4.0 D310 113 09 130 497/4 D331 4.0 D310 130 19 10 10 497/4 D331 4.0 D310 130 19 10 10 497/4 D1295 4.0 D310 130 19 10 10 497/4 D1231 4.0 D310 130 19 10 10 497/4 D1295 4.0 D310 130 110 10 497/4		17-262 E.A3	0.6	405	11.0 cm	13.0	cm	#N/A	
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17-251 E.A3 0.6574 13.0 cm 12.5 cm 4N/A 17-219 E.A2 0.601 10.5 cm 12.5 cm 4N/A									
17-219 E.A2 0.601 10.5 cm 12.5 cm #N/A									
			0.6	574	13.0 cm	12.5	cm		
17-219 E.A3 0.6456 9.5 cm 12.5 cm #N/A		17-219 E.A2				12.5	CPT		
		17-219 E.A3	0.0	456	9.5 cm	12.5	cm		
			Sheet1		۲				

Missing data -combine like-data before Vlookup -sort and Vlookup missing data progressively

Copy fruit ID and save as .txt file etc Import into excel and choose delimiters 17 | 265 | A| 2

Now ready for stats software with year, plot, rep and repeated measures

Summary

- Adopting barcode labels allows you to streamline many aspects of your data collection
- Initial upfront cost pays for itself within one season if you record many observations
- Requires planning ahead and developing systems otherwise it will be slower initially
- Don't be deterred by stories of not being able to see screens outdoors etc
- See webinars 1 & 2 for background information and look for additional resources later this fall

Acknowledgements

- Lindsay WyattSara Shapleigh
- Genomic And Phenomic Tools To Support Vegetable Cultivar
- Emily Rodekohr
- Development: Winter Squash As An Initial Target USDA-AFRI 2013-67013-21232
- Buckler group

Alice Formiga
 Any opinions, findings, conclusions, or recommendations expressed in
 this publication are those of the author(s) and do not necessarily reflect
 the view of the U.S. Department of Agriculture.



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s National Institute of of Food and Agriculture

• Find the other 2 webinars in this series on the Plant Breeding and Genomics YouTube channel at

https://www.youtube.com/user/plantbreedgeno mics/videos

- Please fill out our follow up survey that you'll receive by email
- Thank you for coming!



