

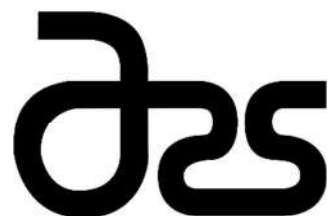


**Agricultural
Research
Service**

***SPECIALIZED LIVING PLANT COLLECTION:
MUTANT FRAGARIA (STRAWBERRY)***

Genetic Improvement of Fruit & Vegetable Laboratory (GIFVL)
@ BARC-W in Beltsville, MD, USA

THURSDAY, OCTOBER 26, 2023



Greenhouse #2 - Bench #1 (GH2S8B1) : Inventory Map

Populations A & C ↓ (Left Rear)				Populations Z, B, & C ↓ (Right Rear)		
T277 x H4 (F ₂ -1)	T277 x H4 (F ₂ -2)	T277 x H4 (F ₂ -3)	T277 x H4 (F ₂ -6)	H4 F ₈ (Sm)	H4 F ₈ (Sm)	H4 F ₈ (Lg)
T277 x H4 (F ₂ -13)	T277 x H4 (F ₂ -16)	T277 x H4 (F ₂ -23)	T277 x H4 (F ₂ -26)	YW5AF7 (Md)	YW5AF7 (Lg)	YW5AF7 (Lg)
T277 x H4 (F ₂ -36)	T277 x H4 (F ₂ -40)	T277 x H4 (F ₂ -47)	T277 x H4 (F ₂ -54)	X	X	X
T277 x H4 (F ₂ -55)	T277 x H4 (F ₂ -56)	T277 x H4 (F ₂ -57)	T277 x H4 (F ₂ -59)	Ruegen F ₈	Ruegen F ₇	Ruegen F ₇
T277 x H4 (F ₂ -60)	T277 x H4 (F ₂ -61)	T277 x H4 (F ₂ -62)	T277 x H4 (F ₂ -64)	X	'Salmon River' F ₈ (Fe def. & Spray damage)	X
T277 x H4 (F ₂ -65)	T277 x H4 (F ₂ -66)	T277 x H4 (F ₂ -67)	T277 x H4 (F ₂ -69)	Y064	Y064 x 'Hawaii 4' (F ₁ -2, S ₁ -30)	Y064 x H4 (F ₁ -2, S ₁ -58)
T277 x H4 (F ₂ -73)	T277 x H4 (F ₂ -74)	T277 x H4 (F ₂ -75)	T277 x H4 (F ₂ -76)	X	Pautuckaway (F ₇ -1)	X
T277 x H4 (F ₂ -77)	T277 x H4 (F ₂ -79)	T277 x H4 (F ₂ -80)	T277 x H4 (F ₂ -83)	<i>palemale</i> x 'Baron Solemacher' (F ₁ -2, S ₁ -149)	<i>palemale</i> x "YW5AF7" (144)	<i>palemale</i> x 'Baron Solemacher' (F ₂ -/ S ₁ -36)
T277 x H4 (F ₂ -85)	T277 x H4 (F ₂ -86)	T277 x H4 (F ₂ -90)	T277 x H4 (F ₂ -94)	X	<i>palemale</i> x 'Baron Solemacher' (F ₁ -2, S ₁ -100)	<i>palemale</i> x 'Baron Solemacher' (F ₂ -/ S ₁ -36)
T277 x H4 (F ₂ -95)	T277 x H4 (F ₂ -96)	T277 x H4 (F ₂ -99)	T277 x H4 (F ₂ -100)	<i>palemale</i> x "YW5AF7" (F ₅ -163, F ₆ -24)	<i>palemale</i> x "YW5AF7" (F ₅ -168, F ₆ -8)	<i>palemale</i> x "YW5AF7" F ₅ -163, F ₆ -15)
T277 x H4 (F ₂ -101)	T277 x H4 (F ₂ -102)	T277 x H4 (F ₂ -103)	T277 x H4 (F ₂ -104)	<i>palemale</i> x "YW5AF7" (F ₁ -2, 29-80 ?)	X	<i>palemale</i> x "YW5AF7" (F ₅ -163, F ₆ -3)
T277 x H4 (F ₂ -105)	T277 x H4 (F ₂ -107)	T277 x H4 (F ₂ -108)	T277 x H4 (F ₂ -109)	<i>palemale</i> ²⁹⁻¹⁵ x "YW5AF7" (S ₁ -383)	<i>palemale</i> ²⁹⁻¹⁵ x "YW5AF7" (S ₁ -6)	<i>palemale</i> ²⁹⁻¹⁵ x "YW5AF7" (S ₁ -2)
T277 x H4 (F ₂ -110)	T277 x H4 (F ₂ -111)	T277 x H4 (F ₂ -114)	T277 x H4 (F ₂ -117)	X	X	X
T277 x H4 (F ₂ -118)	T277 x H4 (F ₂ -120)	T277 x H4 (F ₂ -121)	T277 x H4 (F ₂ -122)	<i>palemale</i> x 'Baron Solemacher' (F ₁ -2, S ₂ -100)	<i>Palemale</i> ²⁴⁻¹⁵ x "YW5AF7" (S ₁ -38)	<i>palemale</i> x "YW5AF7" (F ₅ -163)
T277 x H4 (F ₂ -123)	T277 x H4 (F ₂ -125)	T277 x H4 (F ₂ -126)	T277 x H4 (F ₂ -130)	X	X	LH450
T277 x H4 (F ₂ -132)	T277 x H4 (F ₂ -133)	T277 x H4 (F ₂ -134)	T277 x H4 (F ₂ -135)	703 x yWT (Elongated Neck ?) (Raised Pot)	X	X
T277 x H4 (F ₂ -140)	T277 x H4 (F ₂ -141)	T277 x H4 (F ₂ -142)	T277 x H4 (F ₂ -146)	SR x yWT38 (S ₁ -100, S ₂ -21) (Red, Homozygous, YW5AF7 Mutagen) (Raised Pot)	X	X
X	X	X	T277	X	T277 x H4 (F ₁ -1)	703 x EMS065 (S ₁ -38, F ₁ - ?)
EMS065 x H4 (F ₁ -3, S ₁ -45) (lugft)	H4 x H4 ⁶⁸ (F ₁ -2, S ₂ -21)	WT (F ₁ -112)	YW (F ₁ -6, F ₂ -6, F ₃ -2) x SAF7 (F ₁ -2, F ₁ -1)	703 x YWT (F ₁ -1)	(F ₂ -276) (4 Pack of 2")	y064

Greenhouse #2 - Bench #1: Population Descriptions

GH-R2-Bench 1

Color Key ↑: * = what mutations are visually present (anthers, tapetum, achenes color)

Population A; Population B; Population C; Population Z

Notes ↑:

Population Z: Core Plants

The original (or closet prodigy) *Fragaria* spp. that are used as the parental lines to start the new experimental populations. They include 'YW 5AF7', 'Ruegen', 'Baron Solemacher', 'Hawaii 4', 'Salmon River', and 'Pautuckaway'; all are subspecies *vesca* besides the lattermost which is *bracteata*. Hawaii 4 is the only variety with runners, and Hawaii 4 and YW 5AF7 have yellow fruit while the others have red fruit; these two varieties are known to be genetically transformable, as well. Ruegen has a uniquely different aroma to the slightly darker red color berry. These varieties were selected for traits that allow for experimentation; they have genomes sequenced, established characterizations on appearance and morphology, as well as the ability to be genetically transformed.

H4 F ₈ (Sm)	H4 F ₈ (Sm)	H4 F ₈ (Lg)
YW5AF7 (Md)	YW5AF7 (Lg)	YW5AF7 (Lg)
X	X	X
Ruegen F ₈	Ruegen F ₇	Ruegen F ₇
X	'Salmon River' F ₈ <small>(Fe def. & Spray damage)</small>	X
Y064	Y064 x 'Hawaii 4' (F ₁ -2, S ₁ -30)	Y064 x H4 (F ₁ -2, S ₁ -58)
X	Pautuckaway (F ₇ -1)	X

Population A: T277 x 'Hawaii 4'

The S₁ or F₂ generation of T277 (mutant) x H4. There is 68 total; they have orange tags and DNA has been extracted and is awaiting to be sent out for sequencing. * Some of these have mutations on the anthers; primers have been designed based on a common *Arabidopsis* mutation in hopes that there is not a match, therefore a different genetic location or biological cause in *Fragaria* to this that is novel and impactful. Promotor has tried to be cloned out, with DNA being sent to Plasmids R Us for plasma sequencing. * Achene color mutations may occur as well; this may be an economically viable trait to control due to customer attraction and perception towards fruit appearance. A Novel Basic Scientific Question: What is happening in the genetics of these these mutant plants to make them * not have a tapetum?

T277 x H4 (F ₂ -1)	T277 x H4 (F ₂ -2)	T277 x H4 (F ₂ -3)	T277 x H4 (F ₂ -6)
T277 x H4 (F ₂ -13)	T277 x H4 (F ₂ -16)	T277 x H4 (F ₂ -23)	T277 x H4 (F ₂ -26)
T277 x H4 (F ₂ -36)	T277 x H4 (F ₂ -40)	T277 x H4 (F ₂ -47)	T277 x H4 (F ₂ -54)
T277 x H4 (F ₂ -55)	T277 x H4 (F ₂ -56)	T277 x H4 (F ₂ -57)	T277 x H4 (F ₂ -59)

T277 x H4 (F ₂ -60)	T277 x H4 (F ₂ -61)	T277 x H4 (F ₂ -62)	T277 x H4 (F ₂ -64)
T277 x H4 (F ₂ -65)	T277 x H4 (F ₂ -66)	T277 x H4 (F ₂ -67)	T277 x H4 (F ₂ -69)
T277 x H4 (F ₂ -73)	T277 x H4 (F ₂ -74)	T277 x H4 (F ₂ -75)	T277 x H4 (F ₂ -76)
T277 x H4 (F ₂ -77)	T277 x H4 (F ₂ -79)	T277 x H4 (F ₂ -80)	T277 x H4 (F ₂ -83)
T277 x H4 (F ₂ -85)	T277 x H4 (F ₂ -86)	T277 x H4 (F ₂ -90)	T277 x H4 (F ₂ -94)
T277 x H4 (F ₂ -95)	T277 x H4 (F ₂ -96)	T277 x H4 (F ₂ -99)	T277 x H4 (F ₂ -100)
T277 x H4 (F ₂ -101)	T277 x H4 (F ₂ -102)	T277 x H4 (F ₂ -103)	T277 x H4 (F ₂ -104)
T277 x H4 (F ₂ -105)	T277 x H4 (F ₂ -107)	T277 x H4 (F ₂ -108)	T277 x H4 (F ₂ -109)
T277 x H4 (F ₂ -110)	T277 x H4 (F ₂ -111)	T277 x H4 (F ₂ -114)	T277 x H4 (F ₂ -117)
T277 x H4 (F ₂ -118)	T277 x H4 (F ₂ -120)	T277 x H4 (F ₂ -121)	T277 x H4 (F ₂ -122)
T277 x H4 (F ₂ -123)	T277 x H4 (F ₂ -125)	T277 x H4 (F ₂ -126)	T277 x H4 (F ₂ -130)
T277 x H4 (F ₂ -132)	T277 x H4 (F ₂ -133)	T277 x H4 (F ₂ -134)	T277 x H4 (F ₂ -135)
T277 x H4 (F ₂ -140)	T277 x H4 (F ₂ -141)	T277 x H4 (F ₂ -142)	T277 x H4 (F ₂ -146)

Population B: Sticky Pollen Mutation (*stp*) x 'YW 5AF7' or 'Baron Solemacher'

These are selected and surviving plants from a set of crosses between *palemale* (female) x YW 5AF7 or Baron Solemacher (males / pollen). The *palemale* mutation makes it so * pollen won't be produced, * petals stay on for a long time, and sometimes * anthers develop into petals. These * secondary or double petals are at the expense of the anthers. Some have a mutation causing the * neck closet to the anther to be elongated, expanding excessively. Lutein levels have been measured.

<i>palemale</i> x 'Baron Solemacher' (F ₁ -2, S ₁ -149)	<i>palemale</i> x ''YW5AF7' (144)	<i>palemale</i> x 'Baron Solemacher' (F ₂ -/ S ₁ -36)
X	<i>palemale</i> x 'Baron Solemacher' (F ₁ -2, S ₁ -100)	<i>palemale</i> x 'Baron Solemacher' (F ₂ -/ S ₁ -36)
<i>palemale</i> x ''YW5AF7' (F ₅ -163, F ₆ -24)	<i>palemale</i> x ''YW5AF7' (F ₅ -168, F ₆ -8)	<i>palemale</i> x ''YW5AF7' F ₅ -163, F ₆ -15)
<i>palemale</i> x ''YW5AF7' (F ₁ -2, 29-80 ?)	X	<i>palemale</i> x ''YW5AF7' (F ₅ -163, F ₆ -3)
<i>palemale</i> ²⁹⁻¹⁵ x ''YW5AF7' (S ₁ -383)	<i>palemale</i> ²⁹⁻¹⁵ x ''YW5AF7' (S ₁ -6)	<i>palemale</i> ²⁹⁻¹⁵ x ''YW5AF7' (S ₁ -2)
X	X	X
<i>palemale</i> x 'Baron Solemacher' (F ₁ -2, S ₂ -100)	<i>Palemale</i> ²⁴⁻¹⁵ x ''YW5AF7' (S ₁ -38)	<i>palemale</i> x ''YW5AF7' (F ₅ -163)

Population C: Priority / Random #1

These are a few randomly related plants of selected more immediate importance, placed here due to either lack of room or high priority to work with. Plants here include:

T277 x H4 (F ₂ -123)	T277 x H4 (F ₂ -125)	T277 x H4 (F ₂ -126)	T277 x H4 (F ₂ -130)	X	X	LH450
T277 x H4 (F ₂ -132)	T277 x H4 (F ₂ -133)	T277 x H4 (F ₂ -134)	T277 x H4 (F ₂ -135)	703 x yWT (Elongated Neck ?) (Raised Pot)	X	X
T277 x H4 (F ₂ -140)	T277 x H4 (F ₂ -141)	T277 x H4 (F ₂ -142)	T277 x H4 (F ₂ -146)	SR x yWT38 (S ₁ -100, S ₂ -21) (Red, Homozygous, YW5AF7 Mutagen) (Raised Pot)	X	X
X	X	X	T277	X	T277 x H4 (F ₁ -1)	703 x EMS065 (S ₁ -38, F ₁ - ?)
EMS065 x H4 (F ₁ -3, S ₁ -45) (lugft)	H4 x H4 ₆₈ (F ₁ -2, S ₂ -21)	WT (F ₁ -112)	YW (F ₂ -6, F ₂ -6, F ₃ -2) x SAF7 (F ₂ -2, F ₃ -1)	703 x YWT (F ₁ -1)	(F ₂ -276) (4 Pack of 2")	y064

Greenhouse #2 - Bench #2 (GH2S8B2) : Inventory Map

	Populations D, E, F, G, & H ↓ (Left Rear)			Populations I, J, & K ↓ (Right Rear)				
D →	5AF7-4-4-001-10 (5AF7 Mutant)	S-4-4-061-12 (5AF7 Mutant)	EMS 061-10 (Tall Inflorescence; 5FA& Mutant)	x		Or-703	Or-703	I ←
	S-4-4-121 (5AF7 Mutant)	S-4-4-121 (5AF7 Mutant)	X	x		Or-703	Or-703	
E →	PI 616575 (‘KY 18’; <i>Vesca</i>)	PI551825 (‘New Giant’; <i>Vesca</i>)	PI 616508 (‘Rodluvan’)	Or-703 F ₁ -1, S ₁ -75	Or-703 F ₁ -1, S ₁ -8	Or-703 F ₁ -1, S ₁ -4		
	FRA 382001 (<i>Vesca ssp.</i> <i>Californica</i>)	PI 551508 (‘Rugen’)	PI 552286 (<i>Vesca ssp.</i> <i>Americana</i>)	PI 551525 (‘Salmon River’)	Or-703 F ₁ -1, S ₁ -72 (nr)	Or-703 F ₁ -2, S ₁ -6	X	
F →	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -1	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -2	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -7	Or-703 F ₁ -2, S ₁ -102	Or-703 F ₁ -2, S ₁ -58	Or-703 F ₁ -2, S ₁ -10		
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -13	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -29	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -32	X	Or-703 x EMS065 F ₁ -1, S ₁ -28	SR x ywr52 S ₁ -100, s ₂ -21 X 703 F ₁ -2		
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -32	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -45	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -50	X	ATP 2 H152A (YW5AF7)	ATP 2 H152A (YW5AF7)		J ←
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -55	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -58	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -58	H4 x H4068 F ₁ -2, S ₁ -8	H4 x H4068 F ₁ -2, S ₁ -5	H4 x H4068 F ₁ -2, S ₁ -1		K ←
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -59	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -60	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -61	H4 x H4068 F ₁ -2, S ₁ -31	H4 x H4068 F ₁ -2, S ₁ -25	H4 x H4068 F ₁ -2, S ₁ -24		
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -63	X	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -76	H4 x H4068 F ₁ -2, S ₁ -50	H4 x H4068 F ₁ -2, S ₁ -49	H4 x H4068 F ₁ -2, S ₁ -40		
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -58, S ₁ -4	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -58, S ₁ -1	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -58, S ₁ -2	H4 x H4068 F ₁ -2, S ₁ -80	H4 x H4068 F ₁ -2, S ₁ -77	H4 x H4068 F ₁ -2, S ₁ -75		
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -45 X 5AF7 F ₃ -1	X	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -8 X 5AF7 F ₃ -3	X	H4 x H4068 F ₁ -2, S ₁ -89	H4 x H4068 F ₁ -2, S ₁ -83		
G →	LH50-4 F ₅ -10	X	Octoploid (8n) (Large, Round Pot)	H4 x EMS068 F ₁ -2, S ₁ - 69 (<i>sin</i>)	H4 x EMS068 F ₁ -2, S ₁ - 60 (<i>sin</i>)	H4 x EMS068 F ₁ -2, S ₁ -59 (<i>sin</i>)	H4 x EMS068 F ₁ -2, S ₁ -59 (<i>sin</i>)	
H →	H4 EMS 068	H4 EMS 068	X	H4068 x H4 F ₁ -4, S ₁ -28	H4068 x H4 F ₁ -4, S ₁ -27	H4068 x H4 F ₁ -4, S ₁ -12		L ←
	H4 EMS 068	H4 EMS 068 (T276)	5AF7 x ywt F ₁ -3, S ₁ -38 (Parent Plant) (Raised Pot)	H4068 x H4 F ₁ -4, S ₁ -37	H4068 x H4 F ₁ -4, S ₁ -37	H4068 x H4 F ₁ -4, S ₁ -34		
	H4 EMS 068	H4 EMS 068	H4 EMS 068	H4068 x H4 F ₁ -4, S ₁ -42	H4068 x H4 F ₁ -4, S ₁ -37	H4068 x H4 F ₁ -4, S ₁ -37		
	703 x H4 F ₁ -3, S ₁ -31nr (Non-Runnering) (x2 in x4 Pack Pot)	H4 068 x H4 F ₁ -4, S ₁ -45 (x2 in x4 Pack Pot)	X	H4068 x H4 F ₁ -4, S ₁ -48	H4068 x H4 F ₁ -4, S ₁ -48	H4068 x H4 F ₁ -4, S ₁ -43		
G →	<i>palemale</i> x ‘Baron Solemacher’ F ₁ -2, S ₁ -149 (EMS ?)	X	<i>palemale</i> x ‘Baron Solemacher’ 36	H4068 x H4 F ₁ -4, S ₁ -69	H4068 x H4 F ₁ -4, S ₁ -67	H4068 x H4 F ₁ -4, S ₁ -61		
				EMS068	H4068 x H4 F ₁ -4, S ₁ -74	H4068 x H4 F ₁ -4, S ₁ -69		

Greenhouse #2 - Bench #2: Population Descriptions

GH-R2-Bench 2

Color Key ↑:

Population D;
 Population E;
 Population F;
 Population G;
 Population H;
 Population I;
 Population J;
 Population K

Notes ↑:

Population D

: EMS Mutagenesis Experiment

These are plants from the EMS mutagenesis experiment. Each of these saved plants have a mutation that scored on the 5AF7 mutagenesis. They will (should) have additional white tags that say EMS on them; they start with either S (for EMS), EMS, or 5AF7. The first number is the hours treated for the mutagenesis, the second number is the concentration of the mutagen, the third number is the # of the original plant, and the fourth number (if there) is the # of the seedling. Mutations here include: * Tall Inflorescence (061-10), * Seersucker Leaves (006-12), * low to no, and mostly small fruit (121). Duplicates from some of these have been moved forward to the front little table to be branched crowned. These plants should not be producing runners, if they are (mutation is probably present) make note of such and let JS know. Some of the plants from this population ending in ##1 have been selected for selfing, in order to have mutants and progeny preserved. A quantitative analysis of seed count over time, among other data has been collected. Some of these plants have additional pot indicators showing that something additional (data collection, plant care, etc.) has been done to them.

D →	5AF7-4-4-001-10 (5AF7 Mutant)	S-4-4-061-12 (5AF7 Mutant)	EMS 061-10 (Tall Inflorescence; 5FA& Mutant)
	S-4-4-121 (5AF7 Mutant)	S-4-4-121 (5AF7 Mutant)	X

Population E

: Germplasm Repository Receptions

These plants are the ones from Germplasm Repositories. They are supposed to be true to their variety and have been perpetuated at GIFVL through asexual propagation (runners, or branch crowns), however some don't appear exactly true to characterization (could have been wrong plant sent, plant was labeled wrong, or the repository was using sexual propagation (seed) to 'clone' the plants making the collection different from both true beginning collection and the known characterization. These cultivars include: 'Kentucky Eighteen', 'New Giant', 'Radula' (?), 'Rugen' (possibly genetically different than Core Plant variety), 'Salmon River' (possibly genetically different than Core Plant variety), and two *Fragaria vesca* ssp. *Americana*. All these plants should start with PI#####; the one ssp. *Americana* starts with FRA.

E →	PI 616575 (‘KY 18’; <i>Vesca</i>)	PI551825 (‘New Giant’; <i>Vesca</i>)	PI 616508 (‘Rodluvan’)	
	FRA 382001 (<i>Vesca</i> ssp. <i>Californica</i>)	PI 551508 (‘Rugen’)	PI 552286 (<i>Vesca</i> ssp. <i>Americana</i>)	PI 551525 (‘Salmon River’)

Population F: Sticky Pollen (*stp*) x 'YW 5AF7' (& Select Progeny) Experiment

These plants have red tags with additional white tags that say *stp*. The original Sticky Pollen Mutation (*stp*) plant has been lost, sadly; *stp* was crossed back to 5AF7 and the F₂ / S₁ generation was kept. This section extends the middle section of the left side of the second bench with 16 plants total. These plants should not have runners, as they were never crossed with 'Hawaii 4'. They tend to have rather full canopies with large amounts of densely packed branch crowns, however. Not much needs to be done to these until the Fall, and all the F₂'s needs to branch crowned, but such can wait for now. Some plants have been selected from the F₂ generation and self-crossed (F₂-8, 45, 58) and need to be phenotype in hopes of finding / producing a new sticky pollen mutant (homozygous recessive). There is a F₁-1 in this population as well, that these are progeny from, and a F₃-1 that should segregate out 3:1 if the seeds are collected and grown.

F →	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -1	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -2	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -7
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -13	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -29	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -32
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -32	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -45	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -50
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -55	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -58	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -58
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -59	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -60	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -61
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -63	X	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -76
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -58, S ₁ -4	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -58, S ₁ -1	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -58, S ₁ -2
	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -45 X 5AF7 F ₃ -1	X	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -8 X 5AF7 F ₃ -3

Population G: Octoploids (x2) & Priority / Random #2

These plants are octoploid *Fragaria* x ...

At the front of the table are two palefemale x 'Baron Solemacher' crosses, that did not fit neatly into other populations.

H →	H4 EMS 068	H4 EMS 068	X
	H4 EMS 068	H4 EMS 068 (T276)	5AF7 x ywt F ₁ -3, S ₁ -38 (Parent Plant) (Raised Pot)
	H4 EMS 068	H4 EMS 068	H4 EMS 068
	703 x H4 F ₁ -3, S ₁ -31nr (Non-Runner) (x2 in x4 Pack Pot)	H4 068 x H4 F ₁ -4, S ₁ -45 (x2 in x4 Pack Pot)	X

Population H: EMS 068 (Short Inflorescence)

These plants are the original ones with the short influence mutation from the seed mutagenesis (EMS). They're 7 of them. These plants will runner and have yellow fruit, as they make fertile seed, however they don't always have fully expended receptables and thus often make unfully formed fruits.

G →	LH50-4 F ₅ -10	X	Octoploid (8n) (Large, Round Pot)
H →	H4 EMS 068	H4 EMS 068	X
	H4 EMS 068	H4 EMS 068 (T276)	5AF7 x ywt F ₁ -3, S ₁ -38 (Parent Plant) (Raised Pot)
	H4 EMS 068	H4 EMS 068	H4 EMS 068
	703 x H4 F ₁ -3, S ₁ -31nr (Non-Runnering) (x2 in x4 Pack Pot)	H4 068 x H4 F ₁ -4, S ₁ -45 (x2 in x4 Pack Pot)	X
G →	<i>palemale</i> x 'Baron Solemacher' F ₁ -2, S ₁ -149 (EMS ?)	X	<i>palemale</i> x 'Baron Solemacher' 36

Right Side of Bench (Below ↓)

Population I: I-A: OR-703 (*nr*); I-B: 703 x H4 F₁-1; I-C: 703 x H4 F₁-2; I-D: 703 x EMS065 (*longfruit*)

These plants are 4 of the original (or asexually propagated progeny) of the OR-703 mutation; these were plants from the orange population that did not runner and survived to this point, they're 4 of these. 703 was then crossed with H4 and two of these selected heterozygous plants (F₁-1 and F₁-2) were self-crossed to create additional two subpopulations. The DNA should have been extracted from these I-B and I-C populations and should have the same SNP's when compared; both should not be runnering. The I-D subpopulation is a cross between the nonrunning mutant (703) and the long fruit mutant (EMS065), and then a self-crossed from that progeny. The goal of these latter crosses is to see if long fruit and non runnering mutants are in the same location genetically, which one is forwards or backwards of the other, as well as how longfruit will then segregate out with runners and non-runners. In I-B the runners were removed and then counted as non-runnering, and in I-C the total number of seeds used was not recorded, so the populations have had some experimental error (Brian) I the recent past.

In I-D they're crosses then back to 'Salmon River' (Red Fruit, No runners); the seeds need to be harvested from theses and germinated and the F₂ should then have plants that are yellow-fruited. There is also a 703 x EMS065 (F₁-1, S₁-28) plant that is the same as previous, except it has not been out crossed with 'Salmon River', and this plant serves as the parent plant for the yellow fruit population in GH 4.

x	Or-703	Or-703
x	Or-703	Or-703
Or-703	Or-703	Or-703
F ₁ -1, S ₁ -75	F ₁ -1, S ₁ -8	F ₁ -1, S ₁ -4
Or-703	Or-703	X
F ₁ -1, S ₁ -72 (<i>nr</i>)	F ₁ -2, S ₁ -6	
Or-703	Or-703	Or-703

F ₁ -2, S ₁ -102	F ₁ -2, S ₁ -58	F ₁ -2, S ₁ -10
X	Or-703 x EMS065 F ₁ -1, S ₁ -28	SR x ywr52 S ₁ -100, s ₂ -21 X 703 F ₁ -2

Population J: Auxin Conjugate Transgenics

These plants (x2 ?) are transgenic to overexpress an IAA covalently bound conjugate that was originally observed with Bean, from a previous Post-Doctoral employee who was seeing if these ATP hydrolases would release energy (E) for plant growth, at the direction (or modification) by IAA, to see if IAA can regulate cell growth by controlling how much ATP is hydrolyzed. The original experiment had transgenics for both over and under expression, however just two of the overexpression plants are left.

X	ATP 2 H152A (YW5AF7)	ATP 2 H152A (YW5AF7)
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Population K: H4 x H4068 (*sin*)

These plants are 'Hawaii 4' (female) crossed with Short Inflorescence (*sin*) mutated H4 (= H4 068) (male). They are all Wild-Type (WT) and DNA has been extracted from the ones with pink stickers (half-circles) on the pots. The goal of this population is to ...

H4 x H4068 F ₁ -2, S ₁ -8	H4 x H4068 F ₁ -2, S ₁ -5	H4 x H4068 F ₁ -2, S ₁ -1
H4 x H4068 F ₁ -2, S ₁ -31	H4 x H4068 F ₁ -2, S ₁ -25	H4 x H4068 F ₁ -2, S ₁ -24
H4 x H4068 F ₁ -2, S ₁ -50	H4 x H4068 F ₁ -2, S ₁ -49	H4 x H4068 F ₁ -2, S ₁ -40
H4 x H4068 F ₁ -2, S ₁ -80	H4 x H4068 F ₁ -2, S ₁ -77	H4 x H4068 F ₁ -2, S ₁ -75
X	H4 x H4068 F ₁ -2, S ₁ -89	H4 x H4068 F ₁ -2, S ₁ -83
H4 x EMS068 F ₁ -2, S ₁ -69 (<i>sin</i>)	H4 x EMS068 F ₁ -2, S ₁ -59 (<i>sin</i>)	H4 x EMS068 F ₁ -2, S ₁ -59 (<i>sin</i>)

Population L: H4 068 (*sin*) x H4

This population (H4068 x H4) is the reverse cross of population K (H4 x H4068). This time the population has male and female parents that are switched, the short inflorescence mutation induced H4 068 is the female parent (receiving the pollen), and the 'normal' H4 is the male parent giving the pollen.

H4068 x H4 F ₁ -4, S ₁ -28	H4068 x H4 F ₁ -4, S ₁ -27	H4068 x H4 F ₁ -4, S ₁ -12
H4068 x H4 F ₁ -4, S ₁ -37	H4068 x H4 F ₁ -4, S ₁ -37	H4068 x H4 F ₁ -4, S ₁ -34
H4068 x H4 F ₁ -4, S ₁ -42	H4068 x H4 F ₁ -4, S ₁ -37	H4068 x H4 F ₁ -4, S ₁ -37
H4068 x H4 F ₁ -4, S ₁ -48	H4068 x H4 F ₁ -4, S ₁ -48	H4068 x H4 F ₁ -4, S ₁ -43
H4068 x H4 F ₁ -4, S ₁ -69	H4068 x H4 F ₁ -4, S ₁ -67	H4068 x H4 F ₁ -4, S ₁ -61
EMS068	H4068 x H4 F ₁ -4, S ₁ -74	H4068 x H4 F ₁ -4, S ₁ -69

Greenhouse #2 - Bench #3 (GH2S8B3): Inventory Map

Populations M, N, O, P, & Q ↓ (Left Rear)					Populations R, S, T, U, & V ↓ (Right Rear)				
M	EMS 001	EMS 004	EMS 005	EMS 009	H4 x 703-31 (nr) F ₃ -4, F ₄ -367	H4 x 703-31 (nr) F ₃ -4, F ₄ -377	H4 x 703-31 (nr) F ₃ -4, F ₄ -379	H4 x 703-31 (nr) F ₃ -4, F ₄ -379	T
	EMS 009	EMS 011	EMS 018	EMS 030	H4 x 703-31 (nr) F ₃ -4, F ₄ -289	H4 x 703-31 (nr) F ₃ -4, F ₄ -312	H4 x 703-31 (nr) F ₃ -4, F ₄ -334	H4 x 703-31 (nr) F ₃ -4, F ₄ -357	
	EMS 037	EMS 037	EMS 039	EMS 041	H4 x 703-31 (nr) F ₃ -4, F ₄ -173	H4 x 703-31 (nr) F ₃ -4, F ₄ -203	H4 x 703-31 (nr) F ₃ -4, F ₄ -204	H4 x 703-31 (nr) F ₃ -4, F ₄ -283	
	X	X	X	X	X	X	H4 x 703-31 (nr) F ₁ -3, S ₁ -31	H4 x 703-31 (nr) F ₁ -3, S ₁ -31	
	EMS 041	EMS 042	EMS 045	EMS 046	H4 x 703-31 (nr) F ₁ -3, S ₁ -231 (rr)	H4 x 703-31 (nr) F ₁ -3, S ₁ -255 (rr)	H4 x 703-31 (nr) F ₁ -3, S ₁ -298 (rr)	H4 x 703-31 (nr) F ₁ -3, S ₁ -330 (rr)	U
	EMS 050	EMS 052	EMS 061	EMS 062	H4 x 703-31 (nr) F ₁ -3, S ₁ -58 (rr)	H4 x 703-31 (nr) F ₁ -3, S ₁ -99 (rr)	H4 x 703-31 (nr) F ₁ -3, S ₁ -99 (rr)	H4 x 703-31 (nr) F ₁ -3, S ₁ -113 (rr)	
	EMS 071	EMS 072	X	X	H4 x H4 068 (shif) F ₁ -2, S ₁ -95	H4 x H4 068 (shif) F ₁ -2, S ₁ -93	H4 x H4 068 (shif) F ₁ -2, S ₁ -92	H4 x H4 068 (shif) F ₁ -2, S ₁ -88	
N	EMS 031 H4 F ₁ -3 x F ₁ -2	EMS 031 H4 F ₇ -3 x F ₁ -3	EMS 031 H4 F ₃ -3 x F ₁ -4	EMS 065 X H4 F ₇ -3, F ₁ -1	H4 x H4 068 (shif) F ₁ -2, S ₁ -76	H4 x H4 068 (shif) F ₁ -2, S ₁ -71	H4 x H4 068 (shif) F ₁ -2, S ₁ -68	H4 x H4 068 (shif) F ₁ -2, S ₁ -67	V
	EMS 065 S ₁ -104	EMS 065 S ₁ -104	EMS 065 S ₁ -107	EMS 065 S ₁ -107	H4 x H4 068 (shif) F ₁ -2, S ₁ -64	H4 x H4 068 (shif) F ₁ -2, S ₁ -63	H4 x H4 068 (shif) F ₁ -2, S ₁ -62	H4 x H4 068 (shif) F ₁ -2, S ₁ -62	
O	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -2 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -3 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -6 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -9 (WT)	H4 x H4 068 (shif) F ₁ -2, S ₁ -53	H4 x H4 068 (shif) F ₁ -2, S ₁ -51	H4 x H4 068 (shif) F ₁ -2, S ₁ -48	H4 x H4 068 (shif) F ₁ -2, S ₁ -44	W
	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -15 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -22 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -27 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -33 (WT)	H4 x H4 068 (shif) F ₁ -2, S ₁ -43	H4 x H4 068 (shif) F ₁ -2, S ₁ -41	H4 x H4 068 (shif) F ₁ -2, S ₁ -6	H4 x H4 068 (shif) F ₁ -2, S ₁ -4	
	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -34 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -37 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -49 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -51 (WT)	H4 x H4 068 (shif) F ₁ -2, S ₁ -3	H4 x H4 068 (shif) F ₁ -2, S ₁ -2	H4 x H4 068 (shif) F ₁ -2, S ₁ -?	H4 x H4 068 (shif) F ₁ -2, S ₁ -?	
	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -54 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -63 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -65 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -66 (WT)	X	'Salmon River' Tissue Culture Regeneration 0044	'Salmon River' Tissue Culture Regeneration 0036-3	'Salmon River' Tissue Culture Regeneration 0036-3	
	X	X	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -69 (WT)	EMS 065 (lgft) x H4 F ₁ -3, S ₁ -70 (WT)	X	'Salmon River' Tissue Culture Regeneration 0028B	'Salmon River' Tissue Culture Regeneration 0028B	X	
P	X	X	EMS 065 (lgft) x H4 F ₁ -1, S ₁ -1 (WT)	EMS 065 (lgft) x H4 F ₁ -1, S ₁ -11 (WT)	'Pawtuckaway' F ₇ X H4 EMS 703 (nr)	'Pawtuckaway' F ₇ X H4 EMS 703 (nr)	'Pawtuckaway' F ₇ X H4 EMS 703 (nr)	'Pawtuckaway' F ₇ X H4 EMS 703 (nr)	X
	EMS 065 (lgft) x H4 F ₁ -1, S ₁ -17 (WT)	EMS 065 (lgft) x H4 F ₁ -1, S ₁ -18 (WT)	EMS 065 (lgft) x H4 F ₁ -1, S ₁ -21 (WT)	EMS 065 (lgft) x H4 F ₁ -1, S ₁ -26 (WT)	'Pawtuckaway' F ₇ X H4 EMS 703 (nr)	'Pawtuckaway' F ₇ X H4 EMS 703 (nr)	'Pawtuckaway' F ₇ X H4 EMS 703 (nr)	'Pawtuckaway' F ₇ X H4 EMS 703 (nr)	
	EMS 065 (lgft) x H4 F ₁ -1, S ₁ -27 (WT)	EMS 065 (lgft) x H4 F ₁ -1, S ₁ -36 (WT)	EMS 065 (lgft) x H4 F ₁ -1, S ₁ -36 (WT)	EMS 065 (lgft) x H4 F ₁ -1, S ₁ -37 (WT)	X	'Pawtuckaway' F ₇ X H4 EMS 703 (nr)	'Pawtuckaway' F ₇ X H4 EMS 703 (nr)	'Pawtuckaway' F ₇ X H4 EMS 703 (nr)	
Q	EMS 065 x H4 F ₁ - 3, S ₁ -4 (lgft)	EMS 065 x H4 F ₁ - 3, S ₁ -5 (lgft)	EMS 065 x H4 F ₁ -3, S ₁ -5 (lgft)	EMS 065 x H4 F ₁ - 3, S ₁ -10 (lgft)	EMPTY				
	EMS 065 x H4 F ₁ - 3, S ₁ -14 (lgft)	EMS 065 x H4 F ₁ - 3, S ₁ -18 (lgft)	EMS 065 x H4 F ₁ -3, S ₁ -18 (lgft)	EMS 065 x H4 F ₁ - 3, S ₁ -20 (lgft)					
	EMS 065 x H4 F ₁ - 3, S ₁ -21 (lgft)	EMS 065 x H4 F ₁ - 3, S ₁ -25 (lgft)	EMS 065 x H4 F ₁ -3, S ₁ -30 (lgft)	EMS 065 x H4 F ₁ - 3, S ₁ -35 (lgft)					
	EMS 065 x H4 F ₁ - 3, S ₁ -43 (lgft)	EMS 065 x H4 F ₁ - 3, S ₁ -43 (lgft)	EMS 065 x H4 F ₁ -3, S ₁ -58 (lgft)	EMS 065 x H4 F ₁ - 3, S ₁ -76 (lgft)					
R	X	EMS 065 x H4 F ₁ - 1, S ₁ -5 (lgft)	EMS 065 x H4 F ₁ -1, S ₁ -6 (lgft)	EMS 065 x H4 F ₁ - 1, S ₁ -8 (lgft)					
	EMS 065 x H4 F ₁ - 1, S ₁ -12 (lgft)	EMS 065 x H4 F ₁ - 1, S ₁ -13 (lgft)	EMS 065 x H4 F ₁ -1, S ₁ -14 (lgft)	EMS 065 x H4 F ₁ - 1, S ₁ -23 (lgft)					
	EMS 065 x H4 F ₁ - 1, S ₁ -29 (lgft)	EMS 065 x H4 F ₁ - 1, S ₁ -29 (lgft)	EMS 065 x H4 F ₁ -1, S ₁ -32 (lgft)	EMS 065 x H4 F ₁ - 1, S ₁ -32 (lgft)					
S	X	20-65 (lgft)	84-4 (lgft)	S ₁ -62-10 (lgft)					
	81-13 (?)	EMS 065 x H4 F ₇ - 3, F ₁ -1, S ₁ -4 (Heterozygous)	EMS 065 x H4 F ₁ -1, S ₁ -3, S ₁ -62 (Heterozygous)	EMS 065 x H4 F ₁ - 3, S ₁ -70 (Not WT)					
	X	EMS 065 F ₂ -43, S ₃ -4 (lgft)	EMS 065 F ₂ -43, S ₃ - 4 (lgft)	EMS 065 S ₁ -43, S ₂ -8 (lgft)					

Greenhouse #2 - Bench #3: Population Descriptions

GH-R2-Bench 2

Color Key ↑:

Population M;
Population N;
Population O;
Population P;
Population Q;
Population R;
Population S;
Population T;
Population U;
Population V;
Population W;
Population X

Notes ↑:

Population M: EMS Mutants

These plants are the leftover and surviving mutants from the original mutagenesis of seeds. They each have unique mutations that are of importance. This is documented in the X drive. There is 22 of these.

M	EMS 001	EMS 004	EMS 005	EMS 009
	EMS 006	EMS 007	EMS 018	EMS 020
	EMS 021	EMS 023	EMS 025	EMS 041
	X	X	X	X
	EMS 042	EMS 043	EMS 045	EMS 046
	EMS 052	EMS 053	EMS 061	EMS 062
	EMS 071	EMS 072	X	X

Population N: EMS Mutants (Breeding)

These plants are random EMS mutants that have been bred with other plants for specific gene function and mutation research, however they don't fit in neatly in the other populations. There is 8 of these.

N	EMS 031 H4 F ₁₋₃ x F ₁₋₂	EMS 031 H4 F ₁₋₃ x F ₁₋₃	EMS 031 H4 F ₁₋₃ x F ₁₋₄	EMS 065 X H4 F ₁₋₃ F ₁₋₂
	EMS 065 S ₁₋₁₀₄	EMS 065 S ₁₋₁₀₄	EMS 065 S ₁₋₁₀₇	EMS 065 S ₁₋₁₀₇

Population O: H4 EMS 065 (*longfruit*) x H4 F₁₋₃, S₁-X ... Wildtype

These plants are a cross between the female Hawaii 4 (H4) long fruit mutant (EMS 065) with the male pollen of a 'normal' Hawaii 4 (wildtype). All the plants in this population are Wildtype (WT) and have pink tags with yellow secondary tags. They are from the F₁₋₃ progeny. These are the same as Population P (except those are from the F₁₋₁). There is 18 of these.

O	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₂ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₃ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₄ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₅ (WT)
	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₂₃ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₂₂ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₂₇ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₃₃ (WT)
	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₃₈ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₄₇ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₄₉ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₅₁ (WT)
	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₆₄ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₆₁ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₆₅ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₆₆ (WT)
	X	X	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₄₀ (WT)	EMS 065 (lgt) x H4 F ₁₋₃ S ₁₋₇₀ (WT)

Population P: H4 EMS 065 (*longfruit*) x H4 F₁-1, S₁-X ... Wildtype

These plants are a cross between the female Hawaii 4 (H4) long fruit mutant (EMS 065) with the male pollen of a 'normal' Hawaii 4 (wildtype). All the plants in this population are Wildtype (WT) and have green tags with yellow secondary tags. They are from the F₁-1 progeny. These are the same as Population O (except those are from the F₁-1). There is 10 of these.

P	X	X	EMS 065 (lgf) x H4 F ₁ -1, S ₁ -1 (WT)	EMS 065 (lgf) x H4 F ₁ -1, S ₁ -11 (WT)
	EMS 065 (lgf) x H4 F ₁ -1, S ₁ -17 (WT)	EMS 065 (lgf) x H4 F ₁ -1, S ₁ -18 (WT)	EMS 065 (lgf) x H4 F ₁ -1, S ₁ -21 (WT)	EMS 065 (lgf) x H4 F ₁ -1, S ₁ -26 (WT)
	EMS 065 (lgf) x H4 F ₁ -1, S ₁ -27 (WT)	EMS 065 (lgf) x H4 F ₁ -1, S ₁ -36 (WT)	EMS 065 (lgf) x H4 F ₁ -1, S ₁ -38 (WT)	EMS 065 (lgf) x H4 F ₁ -1, S ₁ -37 (WT)

Population Q: H4 EMS 065 (*longfruit*) x H4 F₁-3, S₁-X ... Mutant

These plants are a cross between the female Hawaii 4 (H4) long fruit mutant (EMS 065) with the male pollen of a 'normal' Hawaii 4 (wildtype). All the plants in this population are mutants and have pink tags with brown secondary tags. They are from the F₁-3 progeny. These are the same as Population O (except these are the mutants from the cross). There is 16 of these.

Q	EMS 065 x H4 F ₁ -3, S ₁ -4 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -5 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -9 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -10 (lgf)
	EMS 065 x H4 F ₁ -3, S ₁ -24 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -28 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -28 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -30 (lgf)
	EMS 065 x H4 F ₁ -3, S ₁ -31 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -33 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -30 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -30 (lgf)
	EMS 065 x H4 F ₁ -3, S ₁ -43 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -43 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -58 (lgf)	EMS 065 x H4 F ₁ -3, S ₁ -76 (lgf)

Population R: H4 EMS 065 (*longfruit*) x H4 F₁-1, S₁-X ... Mutant

These plants are a cross between the female Hawaii 4 (H4) long fruit mutant (EMS 065) with the male pollen of a 'normal' Hawaii 4 (wildtype). All the plants in this population are mutants and have green tags with brown secondary tags. They are from the F₁-1 progeny. These are the same as Population P (except these are the mutants from the cross). There is 11 of these.

R	X	EMS 065 x H4 F ₁ -1, S ₁ -9 (lgf)	EMS 065 x H4 F ₁ -1, S ₁ -6 (lgf)	EMS 065 x H4 F ₁ -1, S ₁ -8 (lgf)
	EMS 065 x H4 F ₁ -1, S ₁ -32 (lgf)	EMS 065 x H4 F ₁ -1, S ₁ -33 (lgf)	EMS 065 x H4 F ₁ -1, S ₁ -34 (lgf)	EMS 065 x H4 F ₁ -1, S ₁ -23 (lgf)
	EMS 065 x H4 F ₁ -1, S ₁ -29 (lgf)	EMS 065 x H4 F ₁ -1, S ₁ -29 (lgf)	EMS 065 x H4 F ₁ -1, S ₁ -32 (lgf)	EMS 065 x H4 F ₁ -1, S ₁ -32 (lgf)

Population S: Mixed / Selected Mutant Plants

These are selected plants on the bench end that are to be cared for more or observed more closely; most are mutants or the breeding experiments and progenies of from the EMS 065 (*longfruit*) that did not fit well into any other populations.

S	X	20-65 (lgft)	84-4 (lgft)	S ₁ -62-10 (lgft)
	81-13 (7)	EMS 065 x H4 F ₁ -3, F ₁ -1, S ₁ -4 (Heterozygous)	EMS 065 x H4 F ₁ -1, S ₁ -3, S ₁ -62 (Heterozygous)	EMS 065 x H4 F ₁ -3, S ₁ -70 (Not WT)
	X	EMS 065 F ₁ -43, S ₁ -4 (lgft)	EMS 065 F ₁ -43, S ₁ -4 (lgft)	EMS 065 S ₁ -43, S ₁ -8 (lgft)

Population T: H4 x 703-31 (nr) F₃-4, F₄-X ... No-Running (nr)

These plants a cross between the female ‘normal’ Hawaii Four (H4) crossed with the male OR-703 non-running (nr). All these plants are non-running; they have white tags with yellow secondary tags. They are comparable with Population U which is the from the same cross but are super runners. There is 14 of these. There is 10 of these.

H4 x 703-31 (nr) F ₁ -4, F ₁ -367	H4 x 703-31 (nr) F ₁ -4, F ₁ -377	H4 x 703-31 (nr) F ₁ -4, F ₁ -379	H4 x 703-31 (nr) F ₁ -4, F ₁ -379	T
H4 x 703-31 (nr) F ₁ -4, F ₁ -289	H4 x 703-31 (nr) F ₁ -4, F ₁ -312	H4 x 703-31 (nr) F ₁ -4, F ₁ -334	H4 x 703-31 (nr) F ₁ -4, F ₁ -357	
H4 x 703-31 (nr) F ₁ -4, F ₁ -173	H4 x 703-31 (nr) F ₁ -4, F ₁ -203	H4 x 703-31 (nr) F ₁ -4, F ₁ -204	H4 x 703-31 (nr) F ₁ -4, F ₁ -283	
X	X	H4 x 703-31 (nr) F ₁ -3, S ₁ -31	H4 x 703-31 (nr) F ₁ -3, S ₁ -31	

Population U: H4 x 703-31 (nr) F₃-4, F₄-X ... Super Runners (rr)

These plants a cross between the female ‘normal’ Hawaii Four (H4) crossed with the male OR-703 non-running (nr). All these plants are super runners, and produce runners intensively; they have white tags with red secondary tags. They are comparable with Population T which is the from the same cross but are non-running. These plants need to have DNA extracted, runner tips harvested, and seed collected. There is x8 of these.

H4 x 703-31 (nr) F ₁ -4, S ₁ -293 (nr)	H4 x 703-31 (nr) F ₁ -4, S ₁ -299 (nr)	H4 x 703-31 (nr) F ₁ -4, S ₁ -298 (nr)	H4 x 703-31 (nr) F ₁ -4, S ₁ -298 (nr)	U
H4 x 703-31 (nr) F ₁ -4, S ₁ -298 (nr)	H4 x 703-31 (nr) F ₁ -4, S ₁ -299 (nr)	H4 x 703-31 (nr) F ₁ -4, S ₁ -299 (nr)	H4 x 703-31 (nr) F ₁ -4, S ₁ -299 (nr)	

Population V: H4 x H4 068 (Short Inflorescence)

These plants are female ‘normal’ Hawaii Four (H4) crossed with male mutated longfruit (EMS 065). These plants are Wildtype (WT), as to build the population in the experimental for static vigor. These need to have runners pegged. There is 22 of these.

H4 x H4 068 (shf) F ₁ -2, S ₁ -95	H4 x H4 068 (shf) F ₁ -2, S ₁ -93	H4 x H4 068 (shf) F ₁ -2, S ₁ -92	H4 x H4 068 (shf) F ₁ -2, S ₁ -88	V
H4 x H4 068 (shf) F ₁ -2, S ₁ -76	H4 x H4 068 (shf) F ₁ -2, S ₁ -71	H4 x H4 068 (shf) F ₁ -2, S ₁ -68	H4 x H4 068 (shf) F ₁ -2, S ₁ -67	
H4 x H4 068 (shf) F ₁ -2, S ₁ -64	H4 x H4 068 (shf) F ₁ -2, S ₁ -63	H4 x H4 068 (shf) F ₁ -2, S ₁ -62	H4 x H4 068 (shf) F ₁ -2, S ₁ -62	
H4 x H4 068 (shf) F ₁ -2, S ₁ -53	H4 x H4 068 (shf) F ₁ -2, S ₁ -51	H4 x H4 068 (shf) F ₁ -2, S ₁ -48	H4 x H4 068 (shf) F ₁ -2, S ₁ -44	
H4 x H4 068 (shf) F ₁ -2, S ₁ -43	H4 x H4 068 (shf) F ₁ -2, S ₁ -41	H4 x H4 068 (shf) F ₁ -2, S ₁ -6	H4 x H4 068 (shf) F ₁ -2, S ₁ -4	
H4 x H4 068 (shf) F ₁ -2, S ₁ -3	H4 x H4 068 (shf) F ₁ -2, S ₁ -2	H4 x H4 068 (shf) F ₁ -2, S ₁ -?	H4 x H4 068 (shf) F ₁ -2, S ₁ -?	

Population W: 'Salmon River' Tissue Culture Regeneration

These plants are Salmon River that has been regenerated from tissue culture from past students. They have a 00## number scheme. These were not transformable, but wanted to show that plants can be grown from tissue culture regeneration; a big problem with TC for *Fragaria* is somoclonal variation, which flow cytometry can help sort out initially before going on to later more intensive procedures and techniques for more explorative analysis. There is five of these.

X	'Salmon River' Tissue Culture Regeneration 0044	'Salmon River' Tissue Culture Regeneration 0036-3	'Salmon River' Tissue Culture Regeneration 0036-3	W
X	'Salmon River' Tissue Culture Regeneration 0028B	'Salmon River' Tissue Culture Regeneration 0028B	X	

Population X: 'Pawtuckaway' F₇ x H4 EMS 703 (non-running) (nr)

These plants are an inbred line of Pawtuckaway as the female crossed with Hawaii 4 mutant EMS (OR-703) for non-running (nr). Pawtuckaway is a pesky flowerer that has to have conditions just right; the flowers are to miniature but smaller and less numerous than typical *Fragaria vesca*. Pawtuckaway is *Fragaria vesca subspecies Americana*. There is a faint pink hue on the petal near the base, not the typical white. The runner less (nr) gene is recessive, and the large fruit size is dominant. The stature of Pawtuckaway had little effect on 703. This population may be able to figure out gene functions on fruit size; USDA geneticist Buckley gives good information about negative traits being bred out as an alternative strategy to positive traits being bred in, for crop improvement. One plant has an anomaly of red achenes on a yellow berry that is of bug size. These need to have seeds harvested from them. There is 11 of these.

'Pawtuckaway' F ₇ x H4 EMS 703 (nr)	'Pawtuckaway' F ₇ x H4 EMS 703 (nr)	'Pawtuckaway' F ₇ x H4 EMS 703 (nr)	'Pawtuckaway' F ₇ x H4 EMS 703 (nr)	X
'Pawtuckaway' F ₇ x H4 EMS 703 (nr)	'Pawtuckaway' F ₇ x H4 EMS 703 (nr)	'Pawtuckaway' F ₇ x H4 EMS 703 (nr)	'Pawtuckaway' F ₇ x H4 EMS 703 (nr)	
X	'Pawtuckaway' F ₇ x H4 EMS 703 (nr)	'Pawtuckaway' F ₇ x H4 EMS 703 (nr)	'Pawtuckaway' F ₇ x H4 EMS 703 (nr)	

Greenhouse #2 - Bench #4 (GH2S8B4) : Inventory Map

Populations Y, Z, & AA ↓ (Left Rear)				Populations AB & AC ↓ (Left Rear)							
Y	T189 x H4 F ₁₋₄ , F ₂₋₁₄	T189 x H4 F ₁₋₄ , F ₂₋₁₅	T239	Random Plants that need to be Worked on (Transplant, Branch Crown, Mist Bench, recovery, etc.)			AB				
	T266	T189 x H4 F ₈₋₁ , F ₁₋₁	T189 x H4 F ₈₋₁ , F ₁₋₂								
	T277 x H4 F ₁₋₁	T290 x H4 EMS 607	X								
	H4 F ₇₋₃ X FRA 1212014840 BarPollen	H4 F ₇₋₃ X FRA 1212014840 F ₁₋₁ , F ₂₋₁₆ Green Triangular Anthers	H4 F ₇₋₃ X FRA 1212014840 F ₁₋₁ , F ₂₋₁₁ (Wildtype)								
	X	X	X								
Z	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₁	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₂	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₃	Random Plants that need to be Worked on (Transplant, Branch Crown, Mist Bench, recovery, etc.)			AC				
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₄	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₅	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₆								
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₇	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₈	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₉								
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₁₀	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₁₁	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₁₃								
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₁₄	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₁₆	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₁₇								
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₁₉	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₂₀	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₂₁								
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₂₂	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₂₃	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₂₄								
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₂₆	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₃₃	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₃₅					stp x 5AF7 F ₁₋₁ , F ₂₋₇₅	stp x 5AF7 F ₁₋₁ , F ₂₋₇₃	stp x 5AF7 F ₁₋₁ , F ₂₋₆₈	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₃₆	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₄₀	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₄₁					stp x 5AF7 F ₁₋₁ , F ₂₋₆₇	stp x 5AF7 F ₁₋₁ , F ₂₋₆₄	stp x 5AF7 F ₁₋₁ , F ₂₋₅₆	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₄₉	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₅₀	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₅₁					stp x 5AF7 F ₁₋₁ , F ₂₋₅₄	stp x 5AF7 F ₁₋₁ , F ₂₋₅₃	stp x 5AF7 F ₁₋₁ , F ₂₋₅₂	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₅₃	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₅₅	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₅₇					stp x 5AF7 F ₁₋₁ , F ₂₋₅₁	stp x 5AF7 F ₁₋₁ , F ₂₋₄₉	stp x 5AF7 F ₁₋₁ , F ₂₋₄₆	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₆₂	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₆₅	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₆₆					stp x 5AF7 F ₁₋₁ , F ₂₋₄₃	stp x 5AF7 F ₁₋₁ , F ₂₋₄₁	stp x 5AF7 F ₁₋₁ , F ₂₋₃₇	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₆₈	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₇₀	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₇₁					stp x 5AF7 F ₁₋₁ , F ₂₋₃₃	stp x 5AF7 F ₁₋₁ , F ₂₋₃₁	stp x 5AF7 F ₁₋₁ , F ₂₋₃₀	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₇₃	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₇₅	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₇₆					stp x 5AF7 F ₁₋₁ , F ₂₋₂₈	stp x 5AF7 F ₁₋₁ , F ₂₋₂₆	stp x 5AF7 F ₁₋₁ , F ₂₋₂₂	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₇₇	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₇₈	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₇₉					stp x 5AF7 F ₁₋₁ , F ₂₋₂₁	stp x 5AF7 F ₁₋₁ , F ₂₋₂₀	stp x 5AF7 F ₁₋₁ , F ₂₋₁₉	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₈₀	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₈₁	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₈₂					stp x 5AF7 F ₁₋₁ , F ₂₋₁₇	stp x 5AF7 F ₁₋₁ , F ₂₋₁₆	stp x 5AF7 F ₁₋₁ , F ₂₋₁₅	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₈₃	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₈₄	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₈₅					stp x 5AF7 F ₁₋₁ , F ₂₋₁₄	stp x 5AF7 F ₁₋₁ , F ₂₋₁₂	stp x 5AF7 F ₁₋₁ , F ₂₋₁₁	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₈₆	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₈₇	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₈₈					stp x 5AF7 F ₁₋₁ , F ₂₋₁₀	stp x 5AF7 F ₁₋₁ , F ₂₋₆	stp x 5AF7 F ₁₋₁ , F ₂₋₅	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₈₉	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₉₁	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₉₂					stp x 5AF7 F ₁₋₁ , F ₂₋₄	stp x 5AF7 F ₁₋₁ , F ₂₋₃	X	
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₉₃	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₉₅	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₉₆					EMPTY			...
	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₉₈	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₉₉	H4 068 (<i>shif</i>) x H4 F ₁₋₄ , S ₁₋₁₀₁					EMPTY			...
AA	T277	T277	T277 X 174 (F ₁₋₂)	EMPTY			...				

Greenhouse #2 - Bench #4: Population Descriptions

GH-R2-Bench 2

Color Key ↑:

Population Y; Population Z; Population AA; Population AB; Population AC

Notes ↑:

Population Y: T Mutants

These are the selected mutants that did not develop fruit from a T numbered population (NOT related to the T population of this document. These plants have four of them (including T277 = Fruitless 1, and T290, etc.) that had a paper written on them. T277 is 'fruitless 1', T 290 is EMS 607, and T189 (maybe T239) the other fruitless mutants in the aforementioned paper. T266 has anthers that occasionally develop some pollen, but not much, sometimes there is 1 or 2 fertilized achenes; this plant maybe able to help out the gene(s) function behind fruitless plants and fruit formation (or lack thereof). Some of these mutants have been backcrossed to Hawaii Four (H4) in order to produce fruit. There has been no discernible segregation in the progeny of F₂ population from T189 and H4. FRA1212014840 has produced some interesting phenotypes and odd mutants; one has triangular green anthers, and another is *barpollen*. The anthers on T239 need to be tested (re-phenotype). There are 11 plants in this population, all mutants of the progeny crosses thereof.

Y	T189 x H4 F ₁ -4, F ₂ -14	T189 x H4 F ₁ -4, F ₂ -15	T239
	T266	T189 x H4 F ₆ -1, F ₁ -1	T189 x H4 F ₆ -1, F ₁ -2
	T277 x H4 F ₁ -1	T290 x H4 EMS 607	X
	H4 F ₇ -3 X FRA 1212014840 <i>BarPollen</i>	H4 F ₇ -3 X FRA 1212014840 F ₁ -1, F ₂ -16 Green Triangular Anthers	H4 F ₇ -3 X FRA 1212014840 F ₁ -1, F ₂ -11 (Wildtype)
	X	X	X

Population Z: Hawaii 4 (H4) EMS 068 (Short Inflorescence) X H4; F₁-1, S₁-X

These plants are a overflow of the Wildtypes (WT) from the cross of the mutant female for short inflorescence (EMS 068) with the male pollen from a 'normal' Hawaii 4 (H4). All these plants are wildtype and take up most of the right side of the fourth bench, sans the random plants at the end. There is 63 of these plants total.

Z	H4 068 (shif) x H4 F ₁ -4, S ₁ -1	H4 068 (shif) x H4 F ₁ -4, S ₁ -2	H4 068 (shif) x H4 F ₁ -4, S ₁ -3
	H4 068 (shif) x H4 F ₁ -4, S ₁ -4	H4 068 (shif) x H4 F ₁ -4, S ₁ -5	H4 068 (shif) x H4 F ₁ -4, S ₁ -6
	H4 068 (shif) x H4 F ₁ -4, S ₁ -7	H4 068 (shif) x H4 F ₁ -4, S ₁ -8	H4 068 (shif) x H4 F ₁ -4, S ₁ -9
	H4 068 (shif) x H4 F ₁ -4, S ₁ -10	H4 068 (shif) x H4 F ₁ -4, S ₁ -11	H4 068 (shif) x H4 F ₁ -4, S ₁ -13
	H4 068 (shif) x H4 F ₁ -4, S ₁ -14	H4 068 (shif) x H4 F ₁ -4, S ₁ -16	H4 068 (shif) x H4 F ₁ -4, S ₁ -17
	H4 068 (shif) x H4 F ₁ -4, S ₁ -19	H4 068 (shif) x H4 F ₁ -4, S ₁ -20	H4 068 (shif) x H4 F ₁ -4, S ₁ -21
	H4 068 (shif) x H4 F ₁ -4, S ₁ -22	H4 068 (shif) x H4 F ₁ -4, S ₁ -23	H4 068 (shif) x H4 F ₁ -4, S ₁ -24
	H4 068 (shif) x H4 F ₁ -4, S ₁ -26	H4 068 (shif) x H4 F ₁ -4, S ₁ -33	H4 068 (shif) x H4 F ₁ -4, S ₁ -35
	H4 068 (shif) x H4 F ₁ -4, S ₁ -36	H4 068 (shif) x H4 F ₁ -4, S ₁ -40	H4 068 (shif) x H4 F ₁ -4, S ₁ -41
	H4 068 (shif) x H4 F ₁ -4, S ₁ -49	H4 068 (shif) x H4 F ₁ -4, S ₁ -50	H4 068 (shif) x H4 F ₁ -4, S ₁ -51
	H4 068 (shif) x H4 F ₁ -4, S ₁ -53	H4 068 (shif) x H4 F ₁ -4, S ₁ -55	H4 068 (shif) x H4 F ₁ -4, S ₁ -57
	H4 068 (shif) x H4 F ₁ -4, S ₁ -62	H4 068 (shif) x H4 F ₁ -4, S ₁ -65	H4 068 (shif) x H4 F ₁ -4, S ₁ -66
	H4 068 (shif) x H4 F ₁ -4, S ₁ -68	H4 068 (shif) x H4 F ₁ -4, S ₁ -70	H4 068 (shif) x H4 F ₁ -4, S ₁ -71
	H4 068 (shif) x H4 F ₁ -4, S ₁ -73	H4 068 (shif) x H4 F ₁ -4, S ₁ -75	H4 068 (shif) x H4 F ₁ -4, S ₁ -76
	H4 068 (shif) x H4 F ₁ -4, S ₁ -77	H4 068 (shif) x H4 F ₁ -4, S ₁ -78	H4 068 (shif) x H4 F ₁ -4, S ₁ -79
	H4 068 (shif) x H4 F ₁ -4, S ₁ -80	H4 068 (shif) x H4 F ₁ -4, S ₁ -81	H4 068 (shif) x H4 F ₁ -4, S ₁ -82
	H4 068 (shif) x H4 F ₁ -4, S ₁ -83	H4 068 (shif) x H4 F ₁ -4, S ₁ -84	H4 068 (shif) x H4 F ₁ -4, S ₁ -85
	H4 068 (shif) x H4 F ₁ -4, S ₁ -86	H4 068 (shif) x H4 F ₁ -4, S ₁ -87	H4 068 (shif) x H4 F ₁ -4, S ₁ -88
	H4 068 (shif) x H4 F ₁ -4, S ₁ -89	H4 068 (shif) x H4 F ₁ -4, S ₁ -91	H4 068 (shif) x H4 F ₁ -4, S ₁ -92
	H4 068 (shif) x H4 F ₁ -4, S ₁ -93	H4 068 (shif) x H4 F ₁ -4, S ₁ -95	H4 068 (shif) x H4 F ₁ -4, S ₁ -96
	H4 068 (shif) x H4 F ₁ -4, S ₁ -98	H4 068 (shif) x H4 F ₁ -4, S ₁ -99	H4 068 (shif) x H4 F ₁ -4, S ₁ -101

Population AA: T277 Mutants

AA	T277	T277	T277 X 174 (F ₁ -2)
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These are a few of the T277 mutants or the crosses and progeny there of that did not fit well into other populations. Two are 'regular' mutant T277 and one is a T277 female crossed with a normal Hawaii 4 (H4) male; there is 3 plants total in this population. The T designation is from a past student and does not have any relation to the T population mentioned in this document.

Population AB: Random Plants that Need Work

Random Plants that need to be Worked on
(Transplant, Branch Crown, Mist Bench, recovery, etc.)

These are randomly assorted and related plants that were selected and placed here due to the need for work to be done with / for them. This would include mist bench overflow and recovery, branch crowns need, transplant ready, etc.; there is no rhyme or reason to placement or relation and hopefully they will be taken care of accordingly to specific needs and be returned to populations of fitment in due time.

Population AC: Sticky Pollen (*stp*) x YW 5AF7 F₁-1, F₂-X

These plants are all wildtypes (WT) from the sticky pollen (*stp*) mutation female crossed with the 'normal' Hawaii 4 (H4). They all are wildtype. These have red tags with white secondary tags and should not have any runners; make note of runners if they do occur. These need to have runner tips harvested and DNA extracted, after the Short Inflorescence (*sin*) mutation plants have such taken care of with them.

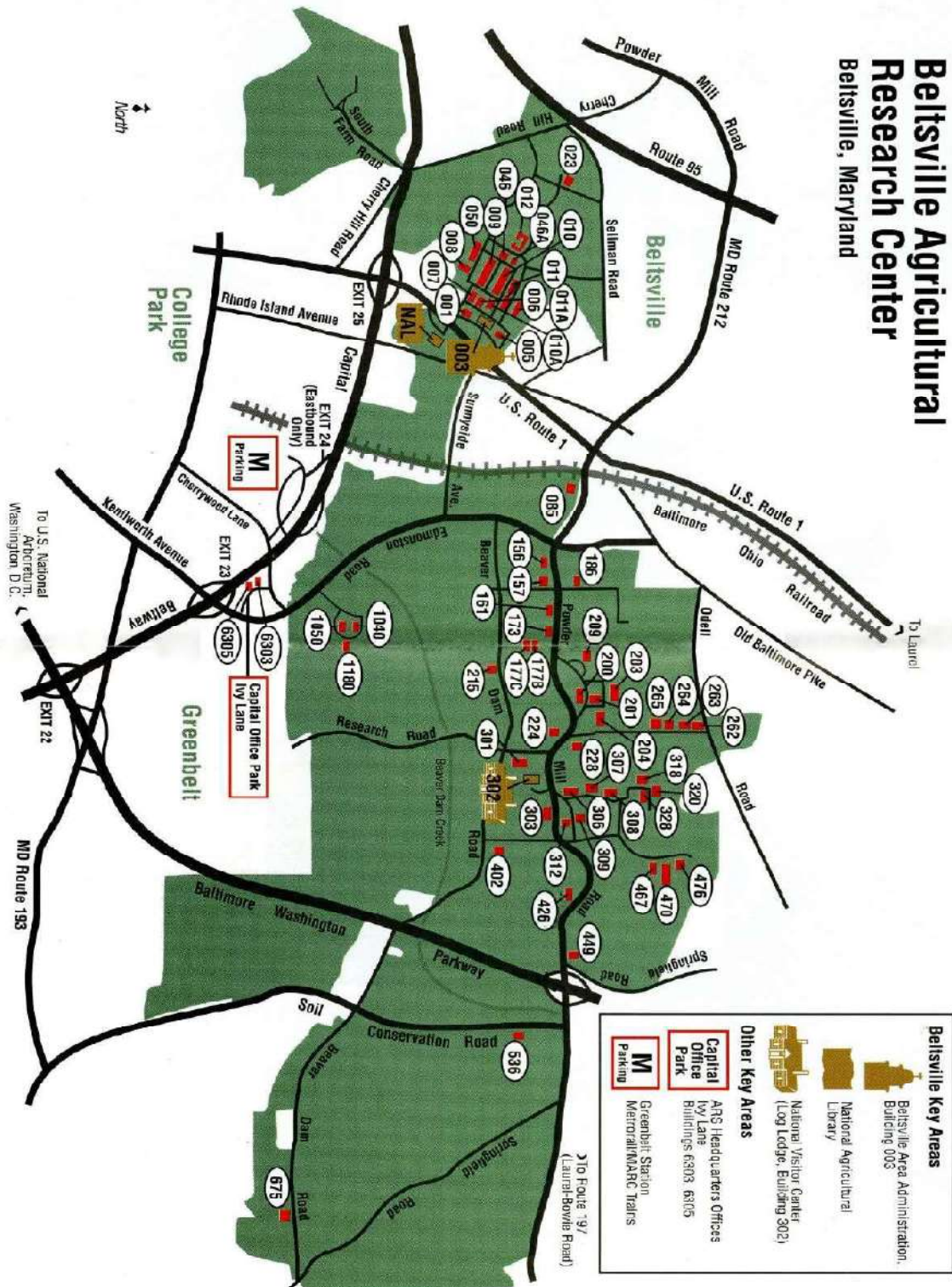
<i>stp</i> x 5AF7 F ₂ -1, F ₂ -75	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -73	<i>stp</i> x 5AF7 F ₂ -1, F ₂ -68	AC
<i>stp</i> x 5AF7 F ₁ -1, F ₂ -67	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -64	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -56	
<i>stp</i> x 5AF7 F ₂ -1, F ₂ -54	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -53	<i>stp</i> x 5AF7 F ₂ -1, F ₂ -52	
<i>stp</i> x 5AF7 F ₂ -1, F ₂ -51	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -49	<i>stp</i> x 5AF7 F ₂ -1, F ₂ -46	
<i>stp</i> x 5AF7 F ₂ -1, F ₂ -43	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -41	<i>stp</i> x 5AF7 F ₂ -1, F ₂ -37	
<i>stp</i> x 5AF7 F ₁ -1, F ₂ -33	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -31	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -30	
<i>stp</i> x 5AF7 F ₂ -1, F ₂ -28	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -26	<i>stp</i> x 5AF7 F ₂ -1, F ₂ -22	
<i>stp</i> x 5AF7 F ₂ -1, F ₂ -21	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -20	<i>stp</i> x 5AF7 F ₂ -1, F ₂ -19	
<i>stp</i> x 5AF7 F ₂ -1, F ₂ -17	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -16	<i>stp</i> x 5AF7 F ₂ -1, F ₂ -15	
<i>stp</i> x 5AF7 F ₂ -1, F ₂ -14	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -12	<i>stp</i> x 5AF7 F ₂ -1, F ₂ -11	
<i>stp</i> x 5AF7 F ₂ -1, F ₂ -10	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -6	<i>stp</i> x 5AF7 F ₂ -1, F ₂ -5	
<i>stp</i> x 5AF7 F ₂ -1, F ₂ -4	<i>stp</i> x 5AF7 F ₁ -1, F ₂ -3	X	

BARC-W Greenhouse Map



BARC Map

Beltsville Agricultural Research Center Beltsville, Maryland



Helpful Links

BARC Chemical Waste Submit Form

<https://forms.office.com/pages/responsepage.aspx?id=5zZb7e4BvE6GfuA8-g1GI74R-othKYBLnC5tVkodMYhUMEZLSVY1NVVDMjFNSEROVDhFUE1LSThDVCQIQCN0PWcu>

BARC Map

<https://www.nal.usda.gov/exhibits/speccoll/files/original/622a787f1e77ca608d58676acb6d6e76.jpg>

BARC Repair Request Form

<https://forms.office.com/pages/responsepage.aspx?id=5zZb7e4BvE6GfuA8-g1GI74R-othKYBLnC5tVkodMYhUMEZLSVY1NVVDMjFNSEROVDhFUE1LSThDVCQIQCN0PWcu>

BLAST – Basic Local Alignment Search Tool

<https://blast.ncbi.nlm.nih.gov/Blast.cgi>

Finds regions of local similarity between sequences. The program compares nucleotide or protein sequences to sequence databases and calculates the statistical significance of matches. BLAST can be used to infer functional and evolutionary relationships between sequences as well as help identify members of gene families.

GDR - Rosaceae Genomic Tools & Database

<https://www.rosaceae.org/>

References & Further Reading

Candidate Gene Identification of Existing or Induced Mutations with Pipeline Applicable to Large Genomes (Dong et al. 2018)

<https://pubmed.ncbi.nlm.nih.gov/30417446/>

Fragaria vesca, a Useful Tool for Rosaceae Genomics (Slovin & Rabinowicz 2007)

https://www.researchgate.net/publication/292736043_Fragaria_vesca_a_Useful_Tool_for_Rosaceae_Genomics

USDA-BARC Map

<https://www.nal.usda.gov/exhibits/speccoll/files/original/622a787f1e77ca608d58676acb6d6e76.jpg>

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