Report compiled by: Dr. Jayesh Samtani, Hampton Roads Agricultural Research and Extension Center, School of Plant and Environmental Sciences, Virginia Beach, VA.

1. List your research and extension projects under the official NCCC 212 objectives, emphasizing collaborative projects with other researchers. A suggested format is below.

Objective 2 - Develop practices for small fruit production tailored for climatic and market needs of growers.

Strawberry:

Study 1. Anaerobic soil disinfestation with different carbon dose rates mixed with yeast in annual hill plasticulture strawberry production.

Authors. Danyang Liu, Jayesh B. Samtani, Charles S. Johnson, Jeffrey Derr, Virginia Tech, VA, and David Butler, Department of Plant Sciences, University of Tennessee, Knoxville, Tennessee, USA.

Study 2. Influence of bacterial endophyte inoculation on strawberry yield in annual hill plasticulture production.

Authors. Robert Chretien[1], Sajeewa Amaradasa[1], Chuansheng Mei[1], Scott Lowman[1], The Institute for Advanced Learning and Research, Danville, VA; Jayesh Samtani and Danyang Liu, Virginia Tech, Virginia Beach, VA.

Study 3. To evaluate yield potential, season extension, and pest susceptibility of strawberry cultivars new to Virginia, in open field and high tunnel, in annual hill plasticulture production systems.

Authors. Jayesh Samtani, Danyang Liu, Aman Rana, Virginia Tech, VA.

2. **How have the results been disseminated to communities of interest? What do you plan to do during the next reporting period to accomplish the goals?**

Data and findings have been disseminated to commercial growers at preplant strawberry meeting which was held virtual in 2020. Studies 1 and 2 should be published or nearing publications at next reporting period. For study 3, we will have more comprehensive report on economic feasibility of annual hill strawberry production in high tunnel environment.

3. Include any data, gemplasm/cultivar descriptions, research results, etc. that you would like to discuss at the meeting. Please keep this brief, highlighting no more than three discussion points within 500 words. Additional information (data tables, abstracts, etc…) can be included in an appendix.

Study 1. Weed control in anaerobic soil disinfestation (ASD) treatments was comparable to fumigated treatment. Presence of yeast improved yield of strawberry crop, with ASD with yeast providing yields comparable to fumigated treatment.

Study 2. Bacillus velezensis, sp. 619 shows promise for field applications in strawberry annual hill plasticulture production.

Study 3. Rocco, Sweet Ann, and Chandler cultivars had the highest total yield in open field, while in high tunnel environment most cultivars except Albion, Flavorfest and Keepsake had similar yield which was higher than the above three cultivars.

4. List retrievable or archived publications arising from your collaborative research projects including journal articles, book chapters, review articles, theses, proceedings, and extension publications. Please use ASHS style.

Flanagan III, R, J.B. Samtani, M. A. Manchester, S. Romelcyzk, C.S. Johnson, W. Lawrence, and J. Pattison. 2020. On-farm evaluation of strawberry cultivars in coastal Virginia. HortTechnology, https://doi.org/10.21273/HORTTECH04616-20

Samtani, J, S. Das*, and J. Rajevich. 2020. Evaluating supplementary nutrients to improve strawberry fruit quality and yield. International Journal of Fruit Science, 20:1029-1038.

Liu, D., J.B. Samtani, C. Johnson, D. Butler, and J. Derr. 2020. "Weed control assessment of various carbon sources for anaerobic soil disinfestation". International Journal of Fruit Science, 20:1005-1018.

Christman, J. and J.B. Samtani. 2019. A survey of strawberry production practices in Virginia**.** Virginia Cooperative Extension Publication, SPES-150P.

Appendix.

Study 1.

	Total weed counts	Total dry biomass (g)	Added synthetic pre-plant N fertilizer (lb/acre)
Nontreated+yeast	135 a[ab]	1318 a	105
Nontreated with standard preplant fertilizer	150 a	1446 a	60
Nontreated	148 a	1667 a	105
Pic 60 at 175 lb/acre	67 bc	657 b	105
C[c] 4mg/g soil+yeast[d]	44 c	449 b	0
C 4mg/g soil+ preplant fertilizer	60 bc	562 b	60
C 4mg/g soil	68 bc	604 b	0
C 2mg/g soil + yeast	57 bc	615 b	0
C 2mg/g soil	76 b	652 b	0
ANOVA *p*-Value	<0.0001	<0.0001	

[a]Mean values with different letters indicate that the means were significantly different using LSD (α=0.05).
[b]All weed counts were collected from viewing window after ASD, from Jan 2020 to Mar 2020. Weed counting was done when weed canopy covered half of the window area in nontreated controls.
[c] C used was brewer's spent grain and paper mulch. Preplant nitrogen rates for all treatments except nontreated + standard preplant fertilizer and C 4mg/g soil + preplant fertilizer were equal at 105 lb/acre and C. Treatments with standard preplant fertilizer had 60 lb/acre of nitrogen added preplant.
[d]Yeast application rate: 1kg/ha.

Treatment	Marketable yield (g/plant)	Total yield(g/plant)	Pre-plant N fertilizer (lb/acre)
Nontreat+yeast	272 cd[a]	280 cd	105
Nontreat+preplant fertilizer	279 bcd	299 bcd	60
Nontreated	219 d	235 d	105
Fumigant	531 a	597 a	105
C[b] 4mg/g soil+yeast[c]	630 a	643 a	0
C 4mg/g soil + preplant fertilizer	394 b	413 b	60
C 4mg/g soil	382 bc	392 bc	0
C 2mg/g soil + yeast	534 a	548 a	0
C 2mg/g soil	383 bc	395 bc	0

[a] Mean values with different letters indicate that the means were significantly different using LSD (α=0.05).
[b] C used was brewer`s spent grain and paper mulch. Preplant nitrogen rates for all treatments except nontreated + standard preplant fertilizer and C 4mg/g soil + preplant fertilizer were equal at 105 lb/acre and C. Treatments with standard preplant fertilizer had 60 lb/acre of nitrogen added preplant.
[c] Yeast application rate: 1kg/ha.

Study 2.

Cumulative marketable and total yield for the 2018-19 growing season at a farm in Fredericksburg, VA.

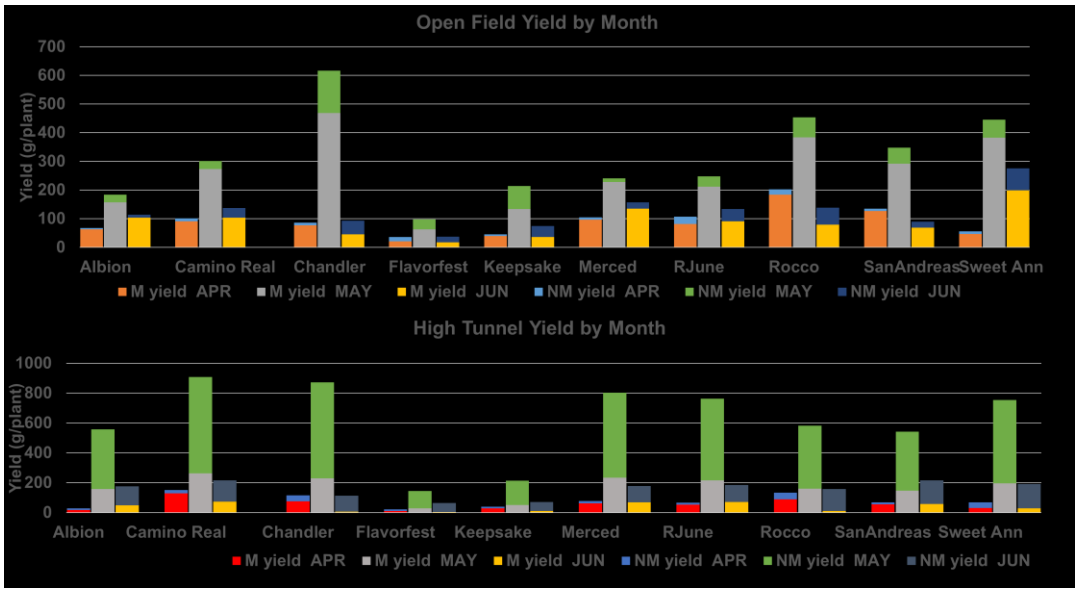
Treatment	Marketable yield (g/plant)	Total Yield (g/plant)
B. *velezensis* IALR 619	270 (+12%)	343 (+11%)
B. *velezensis* IALR 585	231	300
B. *velezensis* IALR 308	220	298
3 B. sp. Combo	206	300
Untreated	241	310
P value, alpha = 0.05	0.2258	0.4007

Cumulative yield for the 2019-20 growing season in Fredericksburg, VA.

Treatment	Marketable yield (g/plant)	Non-marketable yield (g/plant)	Total yield (Market + Non-marketable yield)
B. velezensis IALR 619 (Fall + Spring)	519.6 a	144.2	663.8
B. velezensis IALR 619 (Fall)	463.2 ab	145.5	608.7
Non-treated control	429.8 b	155.5	585.2
$P \leq 0.05$	0.0425	0.1425	0.0655

[a] Mean values with different letters indicate that the means were significantly different using LSD (α=0.05).

Study 3.


Open Field Yield by Month
Yield (g/plant)
700
600
500
400
300
200
100
0
Albion
Camino Real
Chandler
Flavorfest
Keepsake
Merced
RJune
Rocco
SanAndreas
Sweet Ann
M yield APR
M yield MAY
M yield JUN
NM yield APR
NM yield MAY
NM yield JUN
High Tunnel Yield by Month
Yield (g/plant)
1000
800
600
400
200
0
Albion
Camino Real
Chandler
Flavorfest
Keepsake
Merced
RJune
Rocco
SanAndreas
Sweet Ann
M yield APR
M yield MAY
M yield JUN
NM yield APR
NM yield MAY
NM yield JUN