Impact of beneficial microbe treatments on strawberry crop growth, health, and yield

Surendra K. Dara
Strawberry and Vegetable Crops Advisor, University of California Cooperative Extension
San Luis Obispo and Santa Barbara Counties

A study was conducted in summer-planted conventional strawberries in 2016 at Manzanita Berry Farms to evaluate the impact of various beneficial microbial treatments on plant growth, health, and yield.

Untreated control and the grower standard practice (Healthy Soil treatment) were compared with the application of MycoApply EndoMaxx (*Glomus intraradices, G. aggregatum, G. mosseae,* and *G. etunicatum*), Actinovate AG (*Streptomyces lydicus* WYEC 108), and Inocucor Garden Solution (*Saccharomyces cerevisiae* and *Bacillus subtilis*) in the following treatments:

1. Untreated control
2. GS-Healthy Soil
3. MycoApply EndoMaxx 2 gpa transplant dip (TD)
4. MycoApply EndoMaxx 2 gpa drip at planting (DrP)
5. MycoApply EndoMaxx 2 gpa transplant dip + 2 gpa drip at planting
6. MycoApply EndoMaxx 4 gpa transplant dip
7. MycoApply EndoMaxx 4 gpa drip at planting
8. MycoApply EndoMaxx 4 gpa transplant dip + 4 gpa drip at planting
9. Actinovate AG 6 oz/ac transplant dip + 6 oz drip at planting + 6 oz drip monthly (DrM)
10. Inocucor Garden Solution 1 gpa drip at planting + 1 gpa drip monthly

Transplanting was done on 21 May, 2016 with appropriate treatments administered at the time of planting and thereafter. Each treatment had four replications. Canopy growth was measured on June 21, July 5 and 20; powdery mildew severity on August 3, September 1, October 10 and November 16; botrytis severity 3 and 5 days after harvest (DAH) for berries harvested on September 13 and 27, and October 11 and 18; and dead and dying plants were counted on September 16 and October 23. Yield data were collected from August 20 to November 18. Powdery mildew and botrytis fruit rot severity was measured on a scale of 0 to 4 where 0=No disease, 1=1-25%, 2=26-50%, 3=51-75%, and 4=76-100% severity. Data were analyzed and means were separated using LSD test.

Treatment	Canopy growth from 6/21 to 7/20/16 (cm^2)	Powdery mildew on 4 sampling dates	Botrytis on 4 sampling dates		Dead and dying plants on 10/23/16	Seasonal total of marketable berries/plot (lb)
			3 DAH	5 DAH		
1. UC	601.04±27.48 bc	0.33±0.03 abc	1.06±0.06	3.44±0.12	0.50±0.28 b	71.27±2.48
2. HS	587.49±30.36 c	0.24±0.07 c	1.13±0.07	3.31±0.15	3.75±1.31 a	66.22±1.42
3. MA2-TD	701.55±27.40 a	0.44±0.04 a	1.13±0.07	3.75±0.14	1.50±0.86 b	74.10±3.26
4. MA2-DrP	609.35±44.80 bc	0.24±0.12 c	1.00±0	3.50±0.27	1.25±0.25 b	68.50±0.75
5. MA2-TD+DrP	723.08±9.28 a	0.36±0.05 abc	1.06±0.06	3.31±0.12	0.50±0.50 b	72.19±2.80
6. MA4-TD	669.15±20.50 ab	0.29±0.05 bc	1.00±0	3.56±0.12	0.75±0.75 b	75.87±9.85
7. MA4-DrP	612.88±19.02 bc	0.24±0.04 c	1.00±0	2.94±0.12	0.50±0.28 b	72.32±0.42
8.MA4-TD+DrP	655.64±15.74 abc	0.39±0.04 ab	1.06±0.06	3.56±0.15	1.00±1.00 b	67.80±2.95
9. Act-TD+DrP+DrM	669.86±35.16 ab	0.25±0.02 c	0.94±0.06	3.63±0.07	0.25±0.25 ab	74.48±1.89
10. IGS-TD+DrP+DrM	582.15±26.95 c	0.34±0.02 abc	1.00±0	3.25±0.37	1.25±0.75 b	67.85±2.91
P	<0.0001	0.0271	0.2369	0.1991	0.0429	0.6517

Thanks to Dave Peck for his collaboration, Chris Martinez and Tamas Zold for technical assistance, and Valent USA and Inocucor Technologies for the financial support of the study.