

## Summary of 2025 Field Study

Plant Type: Tomatoes, “Lucid Gem”

Summary: On 6 May 2025, we planted 4 Lucid Gem tomatoes in 5 gallon pots. The base soil was fresh potting soil; all got an initial dose of tomato fertilizer, and the same amount of water. We used 4 different ratios: control, 12:1, 20:1, and by area (which works out to ~ 60:1). For example, 20:1 means 20 parts of the potting soil, and 1 part of the SAI blend of biochar, plant compost, animal compost, beneficial bacteria, beneficial fungi, and a water retention ingredient. All are certified by the Ca EPA and by the CDFA, and all are certified organic except for one. The SAI treated plants more than doubled in height in 2 weeks. We saw the first blooms on 20 May 2025; below are measurements and a photo.



Photo 1: L to R, “Control”, 12:1, 20:1, “by area” (~60:1). If you look closely, you can see the first blossoms, the largest leaves, and the difference in height and width/density.

	<u>Ht (cm)</u>	<u>W x L (cm)</u>	<u>Stalk diameter</u>	<u>Largest leaf area (cm<sup>2</sup>)</u>
Control:	41	33 x 30	8.3mm	14.2
12:1	46	37 x 37	8.6mm	42.9
20:1	48	40 x 40	10.9mm	56.1
By area	46	36 x 37	9.7mm	41.1

Analysis: First blooms appeared on 20 May 2025 on the 20:1 and the “by area” plants. The 20:1 plant is doing the best- so far. Compared to the control plant, the 20:1 plant has a plant volume 1.9x larger, the largest leaf is ~ 4x larger, and the cross section of the stalk is ~ 1.7x more area (this is the plumbing of the plant, in both directions).

In 2024, our best tomatoes used a 12:1 ratio. For 2025, we added the fungi, and the best performing plants- the ratio of amendment has been reduced to 20:1, so far. The ultimate metric is the weight of tomatoes/plant; we'll keep monitoring.

Update 27 May 2025:



Photo 2: While all SAI treated plants are taller, are wider, and have thicker stalks, larger leaves, and more blossoms, the 20:1 plant seems to be outperforming the others.

The largest leaf on this SAI treated plant is ~2.2x larger than the largest leaf on the control plant.

The stalk diameter on the SAI treated plant is 1.3cm vs 0.94cm, for a stalk cross section area of ~ 1.9x more surface area than the stalk on the control plant.



Photo 3: The plant volume of the SAI treated plant is ~ 2.5x greater than the plant volume of the control plant.

The # of blossoms on the SAI treated plant is some 3x more than the control plant (12 vs 4).

We will continue to monitor, and to report on the differences in plant size, and eventually on the # and size of harvested tomatoes.

11 June Update: While the treated plants still outpace the untreated plants in plant height, width, stalk diameter and largest leaf size, they have shifted their energies to fruit production. As of today, the 20:1 plant remains the highest performer. It has 3 tomatoes and 43 blossoms on it today. The control plant has 1 tomato and 18 blossoms on it today. So current status is 3x

more fruits, and  $43/18 = \sim 2.4x$  more blossoms/plant. These results are in line with what we've been measuring for tomatoes, for the last two years.



Photo 4 (l): Just to calibrate, I count this as “4” blossoms on this stalk, though 11 other visible buds are likely to become blossoms. These four are clearly yellow and open; the others are not- yet.

Photo 5 (r): I count this as “1” tomato, though several other “old” blossoms are on this stalk, the tiny fruits are not yet clearly visible.

18 June 2025 Update: As of today, both the 12:1 and the 20:1 plants have 12 tomatoes, and the control plant has 4. This is 3x more tomatoes per plant. Both of these plants also have more blossoms/plant, 40 vs 16 for the control plant. That's 2.5x more blossoms per plant. The 60:1 plant is barely outperforming the control.

I'll be planting another set of 4 tomatoes today, with these ratios: control, 12:1, 20:1 and 30:1. Tomatoes are a good plant, since they respond so quickly to changing inputs.

2 July 2025 Update: we continue to see the 3:1 ratio of tomatoes, on the 20:1 plant. We saw it at 19:6 (# of tomatoes on the 20:1 plant, vs # of tomatoes on the control plant), 21:7, and today at 25:8. We have stopped counting blossoms. As the photos below show, the average size of each tomato is also larger on the 20:1 plant. The 12:1 plant is slightly worse than the 20:1 plant, and the 60:1 plant is still slightly better than the control plant. The 20:1 plant stopped growing vertically, and seems to be putting its resources into the fruits, not into plant growth. The differential between largest leaf size remains, while the differential between stalk width has narrowed (12.45cm vs 11.78cm diameter).



Photo 6 (l): Control plant, with 8 tomatoes. (green tag)

Photo 7 (r): 20:1 plant, with 25 tomatoes. (red tag) The tomatoes are also visibly larger, on average, than the tomatoes on the control plant.

#### 16 July 2025 Update:



Photo 8: L to R, control plant, 12:1 plant, 20:1 plant, ~60:1 (by surface area) plant.

The control plant has 9 tomatoes, the 12:1 plant has 22 tomatoes, the 12:1 plant has 29 tomatoes, and the “by area” (~60:1) plant has 11 tomatoes. Thus the ratio of “3x more tomatoes on the 20:1 plant than on the control plant” continues. The 20:1 also appear larger than the tomatoes on the control plant. The plants look like they have shut off producing new blossoms (i.e. no bright yellow blooms), though a few blossoms look like they might be pollinated, and might become additional fruits.

## Summary of 2025 Field Study

Plant Type: Cherry Tomatoes, “San Francisco Fog”

Summary: On 2 July 2025, we planted 3 “San Francisco Fog” cherry tomato plants in 2 gallon pots. The base soil was fresh potting soil; all got an initial dose of tomato fertilizer, and the same amount of water. The purpose of this experiment was to compare a competitor, “Seacoast Compost”. We used 3 different ratios: control, control plus the SAI amendment- substituting Seacoast Compost for our custom blend of plant and animal composts- at the same ratio of 20:1, and the control plus the SAI soil amendment at 20:1 (what seems to be optimal for the 2025 blend). For example, 20:1 means 20 parts of the potting soil, and 1 part of the SAI blend of biochar, plant compost, animal compost, beneficial bacteria, beneficial fungi and a starter food for the fungi, and a water retention ingredient. The purpose of this experiment was to understand *if* the competitor Seacoast Compost produced a beneficial plant response, when it had the benefit of our other ingredients. All SAI materials are certified by the Ca EPA and by the CDFA, and all are certified organic except for one. All three plants were planted at 23cm tall; the SAI plant today is ~37cm tall.



Photo 1: L to R, “Control”, Seacoast Compost blended with SAI biochar, bacteria and fungi at 20:1, SAI amendment at 20:1. Note yardstick on the R.

16 July 2025 Update: The SAI 20:1 plant is growing the fastest: it is taller, wider, and has larger leaves than the other two. Respectively the Control plant has 2 clusters, and 5 tomatoes. The largest tomato has a diameter of 1.81cm; that sphere volume is 3.1cm<sup>3</sup>. The Seacoast Compost plant has 2 clusters, and 4 tomatoes. The largest tomato has a diameter of 1.67cm; that sphere volume is 2.4cm<sup>3</sup>. The SAI amendment plant has 3 clusters, and 5 tomatoes. The largest tomato has a diameter of 2.69cm; that sphere volume is 10.2cm<sup>3</sup>. This cluster has three additional blooms at the end; the other two plants don’t - yet.

While we expected the SAI amended plant to perform the best, this is the second experiment with Seacoast Compost, that is underperforming. That is surprising. While of academic interest, we have little commercial interest is pursuing this further.

## Summary of 2025 Field Study

### Plant Type: Cherry Tomatoes, “Sungold”

Summary: On 20 June 2025, we planted 4 “Sungold” cherry tomato plants in 3 gallon pots. The base soil was fresh potting soil; all got an initial dose of tomato fertilizer, and the same amount of water. We used 4 different ratios: control, 12:1, 20:1, and 30:1. For example, 20:1 means 20 parts of the potting soil, and 1 part of the SAI blend of biochar, plant compost, animal compost, beneficial bacteria, beneficial fungi, and a water retention ingredient. All SAI materials are certified by the Ca EPA and by the CDFA, and all are certified organic except for one. All 4 plants started at 17cm tall.

15 July 2025 Update: The 20:1 plant is much larger than the others. The 20:1 plant is 86cm tall and 66cm wide, while the control plant is 57cm tall and 41cm wide. (photo 1)



Photo 1: L to R, “Control”, 12:1, 20:1, 30:1.

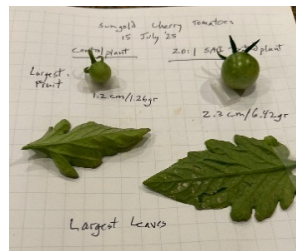


Photo 2: The largest leaf and the largest tomato, from a control plant, vs. the 20:1 SAI treated plant.

The largest leaf on the 20:1 plant is ~2.5x larger than the largest leaf on the control plant.

While all 3 SAI plants currently have 7 tomato clusters, the control plant has 5 tomato clusters (at various stages of bloom/fruit). The largest tomato from all 3 SAI treated plants is about the same size, roughly weighing some 5x more than the largest tomato on the control plant. In prior studies with cherry tomato plants, we routinely see more cherry tomatoes/plant, though the maximum size is usually similar. We suspect that the current size difference is due to blooming 7-10 days earlier.

This is the 3<sup>rd</sup> tomato type in 2025 which appears to be optimal at 20:1 in fresh planting soil.

## Summary of 2025 Field Study

Plant Type: Cherry Tomatoes, “Sweet 100”

Summary: On 20 June 2025, we planted 3 “Sweet 100” cherry tomato plants in 2 gallon pots. The base soil was fresh potting soil; all got an initial dose of tomato fertilizer, and the same amount of water. The purpose of this experiment was to compare a competitor, “Seacoast Compost”. We used 3 different ratios: control, control plus the Seacoast Compost at their recommended ratio of 6:1 (note: 3.3x more compost per plant than the SAI amendment), and the control plus the SAI soil amendment at 20:1 (what seems to be optimal for the 2025 blend). For example, 20:1 means 20 parts of the potting soil, and 1 part (at our optimal ratio) of the SAI blend of biochar, plant compost, animal compost, beneficial bacteria, beneficial fungi and a starter food for the fungi, and a water retention ingredient. All SAI materials are certified by the Ca EPA and by the CDFA, and all are certified organic except for one. The control plant started at 19 cm tall, while the other two started at 16cm tall.



Photo 1: L to R, “Control”, Seacoast Compost at 6:1, SAI amendment at 20:1. Note yardstick on the R; SAI plant is about 75cm tall.

16 July 2025 Update: The SAI 20:1 plant is growing the fastest: it is taller, wider, and has larger leaves than the other two. (surprisingly the Seacoast Compost Plant is the smallest plant.) Respectively the Control plant has 7 clusters, and the most blossoms on a cluster is 13. (the clusters are still lengthening and producing more blossoms from the ends.) The Seacoast Compost plant has 7 clusters, and the most blossoms on a cluster is 11. The SAI amendment plant has 11 clusters, and the most # of blossoms on a cluster is 15. Tiny tomatoes are visible.

We also performed another experiment with the Seacoast Compost, replacing our composts with it, thus providing it the potential benefits of our biochar, and of our beneficial bacteria and fungi. That experiment (current result), is documented by SAI with the cherry tomato plant type “San Francisco Fog”.