

SAP EXPERIMENT

Condition:

LOCATION

Osaka, Japan

SUNLIGHT

Good

WATERING

Basically no watering during the winter season, until March.

SOIL

Fine grain. Mixing several soils is to minimize possible influences from a particular soil.

PLANTS

Loose leaf lettuce "Green Wave" by Takii Seeds. It is described to be good for sowing up to late September.

CONTAINER

Black plastic containers No.9 (capacity: 13.5 liters) with large and many drainage holes in the bottom. Don't let the soil leak off the drainage holes, a square plastic mesh for drainage holes is laid on the bottom of each pot.

WATER RETAINER AGENT

SAP From SOCO (Potassium Polyacrylate)

Experimental Procedure:

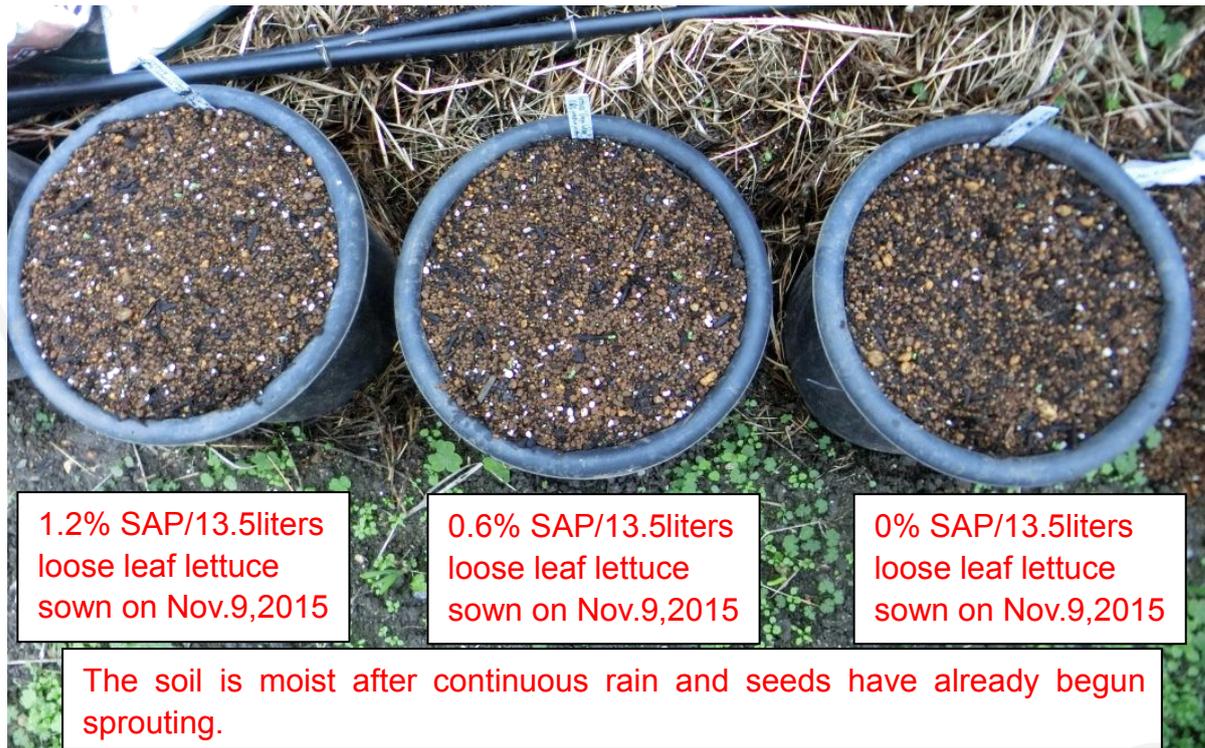
1. Mix the soils evenly.
2. Deal the mix obtained on 3 pots, about up to 1cm below to the rim (hence the soil amount is assumed to be 13.5 liters, same as the pot capacity).
3. Put the SAP at the contents of 0%, 0.6%, 1.2% (the recommended dosage by SOCO is 1.25%). Macerate the soil with the SAP added in.
4. Press the surface soil with palms to settle it.
5. Sow loose leaf lettuce seeds: 20 seeds/pot.

History:

1. Nov. 9, 2015 Preparations completed.



2.Nov.15, 2015 Plants have begun sprouting.



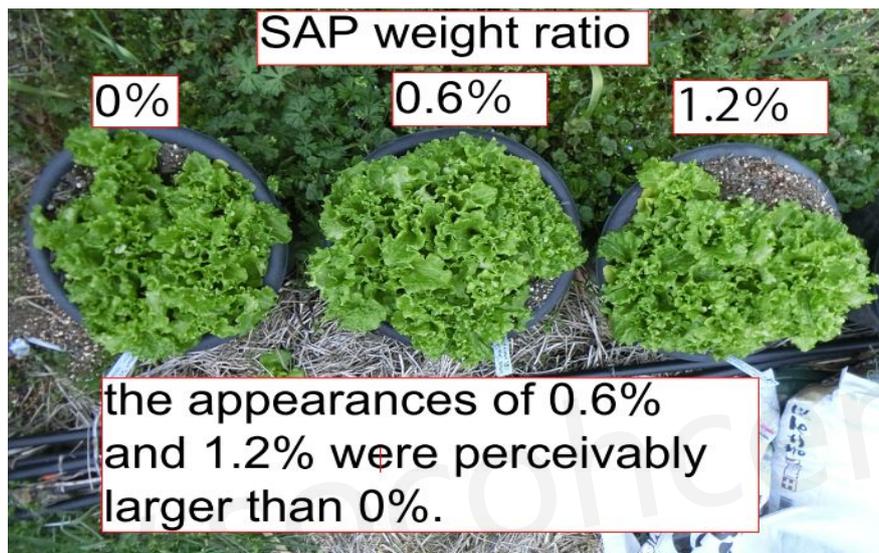
3.Mar.13,2016 Have a result.

Results:

APPEARANCE

0.6% and 1.20% looked well perceivably larger than 0%.

Between 0.6% and 1.2%, 0.6% seemed to cover more area of the surface of the pot soil.



The growth of the roots showed much more difference. When pulling off lettuces, it was not so difficult to plug the whole roots in the pot of 0%. But in the pots of 0.6% and 1.2%, especially 1.2%, the roots were deep and large you need to hold the soil right below the

leaves.

The roots of a lettuce in the pot for 1.2% showed it is utilizing the moisture from SAP.



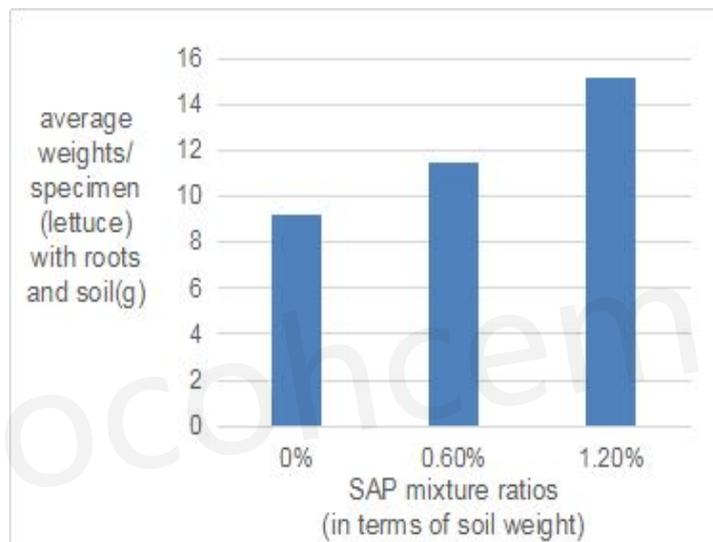
GERMINATION

After used SAP, the germination rate is 18/20 seeds, around **90%**.

GROWTH

From figures as follows, SAP mixture ratios and the corresponding average unit weights of lettuces seem to indicate a proportional relation between the growth of lettuces and SAP dosage.

SAP mixture ratios (in terms of soil weight)	average weights of one specimen (lettuce) with roots and soil(g)
0%	9.2
0.60%	11.4
1.20%	15.1





(Soil was intentionally allowed to remain on the roots in weighing because the soil attached to the roots will enable to take into account the growth of roots, which is essential for the tolerance to drought and the nutritional absorption.)

Conclusion:

1. The lettuces in 1.2% SAP pot have increased by **64.13%** in yield.
2. The results also show super absorbent polymer strongly prevented shortage of water and the subsequent stomatal closures in the day time, enabling the plants to take in CO_2 from stomata to perform photosynthesis.