

# Scope of Homoeopathic Medicine Carbo vegetabilis and Silicea Terra to Improve the Water Retaining Capacity in Cucumis Sativus L.

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**Abstract - BACKGROUND:** Agriculture is the principal source of livelihood for more than 40 % of the population of Tamilnadu. It was the key development in the rise of our human civilization (1)(2). In Agriculture, Cucumber is a widely cultivated creeping vine plant in the Cucurbitaceae gourd family. Its shallow nature of roots requires an adequate amount of water throughout its life. In the agricultural field, water scarcity is a major environmental factor that affects the cultivation of crops as we all know Tamilnadu is also facing the same problem. To overcome this situation, Agro homoeopathy will greatly help by improving the plants development process in a better way (7). Charles Darwin also wrote that the potentised remedies had a good effect on plants (3). Agro homoeopathy makes the plants resistant to disease and pests by strengthening them from the inside out (15). In this study, Carbo vegetabilis and Silicea terra are the two out of hundreds of remedies that are being used on plants that they have great effects on development of plants in its all way (6) By regulating the transpiration process and controlling the condensation of the plant, we can achieve our aim. By reducing the evapotranspiration, the amount of water which would be needed for the cultivation will be reduced. By using the homoeopathic drugs Silicea terra (4) and Carbovegetabilis(5), we can reduce the amount of water usage in cultivation by improving the water retaining capacity of the plant and soil which can overcome the water insufficiency in agricultural fields.

**OBJECTIVE:** To assess the efficacy of Carbo veg (200C & 30C) and Silicea terra (200C & 30C) on water retaining capacity in Cucumis sativus L.and improve the growth and yield of the plant by using the minimal amount of water with the help of the homoeopathic drug and also to find out and compare the pesticidal action of Carbo veg and silicea in cucumber plant.

**METHOD:** 4 sets of plants were grown in which 2 belong to control sets and 2 sets were medicinally irrigated under proper schedule. Each and every progress of all

the 4 sets of plants were noted to compare the efficacy of homoeopathic drugs on plants.

**RESULT:** From this study, Silicea and Carboveg enhance the water retaining capacity in the soil and plant, respectively. In plant Carbo veg act by controlling the transpiration process and improving the condensation process, which shows its effectiveness in this field. Silicea shows its effectiveness in the soil by holding the maximum water content when compared to the other sets and control sets. As a whole, the dynamic property of the Homoeopathic drugs acts greatly in the plant.

**CONCLUSION:** All the plants were grown healthier than the control sets, as they were affected. From the above study it is proved that the Homoeopathic dilutions of Carbo Veg and Silicea are highly effective in improving the water retaining capacity of the plant and soil and also its healthy growth.

**Index Terms** - Cucumis sativus.L, Water retaining capacity, Transpiration process, Relative water content method (RWC).

## INTRODUCTION

Agriculture is the principal source of livelihood for more than 40 % of the population of Tamilnadu. In India, 70% of the population earns their livelihood from agriculture. It was the key development in the rise of our human civilization and created food surpluses that enabled people to live in cities. Farming is said to be the simplification of the food web. It also helps the non-agricultural sectors and the industrial sectors by providing the raw materials. A good performance of the agriculture sector is viewed as an effective instrument for attainment of poverty reduction (1).

In Agriculture, Cucumber is a widely-cultivated creeping vine plant in the Cucurbitaceae gourd family

(7). Its shallow nature of roots requires an adequate amount of water throughout its life. It always needs the moisture soil around for its healthy growth. In the agricultural field, water scarcity is one of the causes that threaten the farmers for their cultivation of plants and these kinds of vegetables cannot be avoided from our routine diet. Cultivating these kinds of high-water consuming plants, face so many difficulties in the agricultural field. In this Century, water scarcity is a major environmental factor that has a major role in affecting the cultivation of crops as we all know Tamilnadu is also facing the same problem. India has 17.8% of the world population. Population of Tamilnadu in 2011 was 72.14 million and it increased to 81.20 million in 2019. In India, it is estimated that 51% of precipitation goes as evaporation and the remaining 49% is the annual water resources that are 1953 KM<sup>3</sup>. However, the present quantity of water from both surface and groundwater resources is only 600 KM<sup>3</sup>. This is only 31% of annual water resources (2). Deficit irrigation will surely reduce the crop production.

To overcome this situation, Agro homeopathy will greatly help by improving the plants development process in a better way. Agrohomeopathy was first mentioned almost 200 years ago in the writings of Boenninghausen. He noted that the excess or leftover remedies he threw into his plant pots were having an effect on the plants, but he never took the research further (14). Charles Darwin, after his cure with homeopathy, also wrote that the potentised remedies had a good action on plants (3).

Agrohomeopathy is better than organic or biodynamic farming. It is the most chemical free, low cost, non-toxic method of growing food and other crops which is an alternative to chemical pesticides. Agro homeopathy makes the plants resistant to disease and pests by strengthening them from the inside out (15). In the late 19th and early 20th centuries both Rudolph Steiner and Lilly Kolisko experimented with various substances on plants (3).

In this study, two homeopathic remedies were used for helping the agricultural field. Carbo vegetabilis(10) and Silicea(9) terra are the two out of hundreds of remedies that are being used on plants that they have great effects on development of crops, their diseases, and also a pest control(11) so we can avoid

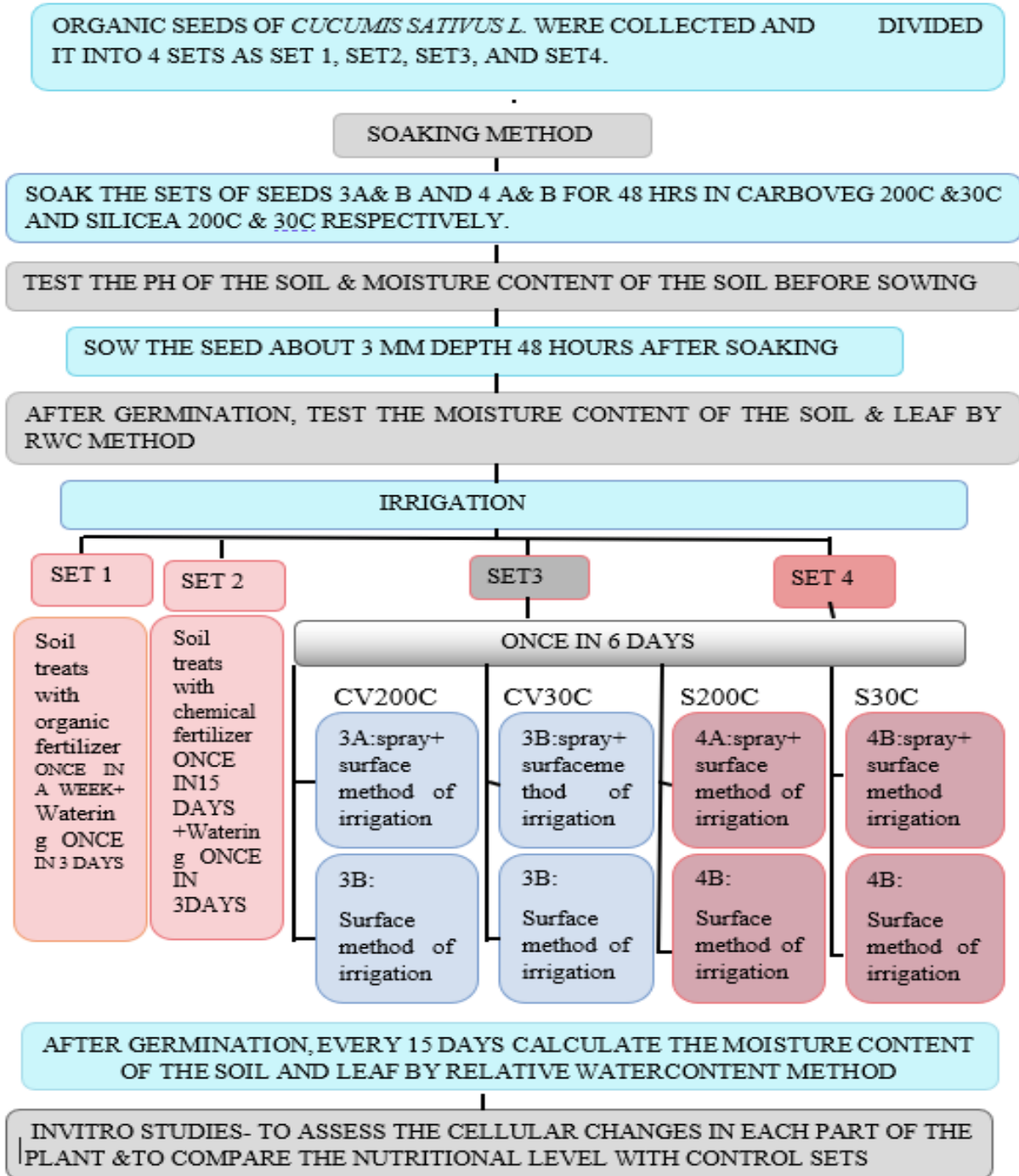
the application of harmful agrochemicals in agriculture particularly in food crops. (6)

By regulating the transpiration process and controlling the condensation of the plant, we can achieve our aim. By reducing the evapotranspiration, the amount of water which would be needed for the cultivation will be reduced. By using the homeopathic drugs Silicea terra(4) and Carbovegetabilis(5), we can reduce the amount of water(12)(13) usage in cultivation by improving the water retaining capacity of the plant and soil which can overcome the water insufficiency in agricultural field.

#### MATERIALS AND METHODS

- Seeds of Cucumis sativus L.(cucumber) of same origin was collected from organic nursery and was divided into 4 sets which was further known by S3A, S3B & S4A,S4B .Each set contains 5 seeds and was soaked in homeopathic dilutions CV 200C, CV30C, S200C and S30C
- After 48 hrs, seeds were sowed.
- Medicinally untreated seeds were sowed in two bags and named as S1 &S2 which were treated with organic and chemical fertilizers respectively.
- Control sets (S1&S2) were irrigated once in 3 days and S1 is treated with organic fertilizer once in a week and S2 is treated with chemical fertilizer (NPK) once in 15 days.
- S3A, S3B, S4A&S4B were irrigated once every 6 days. S3A &S4A were drenched by both spray and surface method; S3B &S4B were drenched only by surface irrigation method. Two methods of irrigation were used.
- Moisture content in the soil was measured once in a month using a formula.
- Moisture content in the leaf was measured using the Relative Water Content method.
- Germination rate, flowering rate (both male and female flower), stem, leaf, plant height, fruits of both control and medicinally treated plants were observed. And also the developing variation between the sets A (irrigated by both spray and surface method) & sets B (only by surface method) were assessed.

DETAILED ALGORITHM:



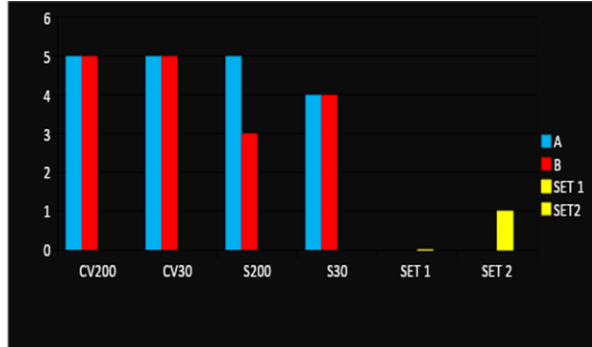
OBSERVATION AND RESULT: GERMINATION RATE OF BOTH SOAKED AND UNSOAKED SEEDS (EACH SET CONTAINS 5 HANDPICKED SELECTIVE SEEDS:

Observation: Maximum seeds germinated in the set which contains seeds soaked in Carbo Veg and

moderate in Silicea and is minimum in the control sets. Homoeopathic medicines significantly reduce the time it takes for a seed to germinate.

SETS	SET 1	SET 2	SET 3	SET 4		
DATE: 9/2/2020			CV200	CV30	S200	sil30
	0	1	5	5	5	4
			5	5	3	4

Germination rate of both soaked and unsoaked seeds within 3 days:



GROWTH RATE OF THE PLANT WHICH IS MEDICINALLY IRRIGATED ONCE IN 6 DAYS (CM):

OBSERVATION: All the medicated sets show a maximum growth when compared to the control sets. Among all medicated sets of plant, Carboveg 30C (B) shows a maximum growth.

Date	Carboveg200		Carboveg 30		Silicea 200		Silicea 30	
	A	B	A	B	A	B	A	B
10/3/2020	104	96	72	84	94	94	110	56
20/3/2020	150	191	135	152	148	200	180	110
1/4/2020	300	325	228	314	272	364	307	283
21/4/2020	315	330	328	325	305	392	310	294
1/5/2020	315	338	353	418	316	398	317	295

GROWTH RATE OF MEDICINALLY UNTREATED PLANT WHICH IS IRRIGATED ONCE IN 3 DAYS:

DATE	SET 1	SET 2
10/3/2020	52	55
20/3/2020	95	90
1/4/2020	155	230
21/4/2020	195	240
1/5/2020	220	250

Growth rate in plants which were both medicinally treated and untreated:

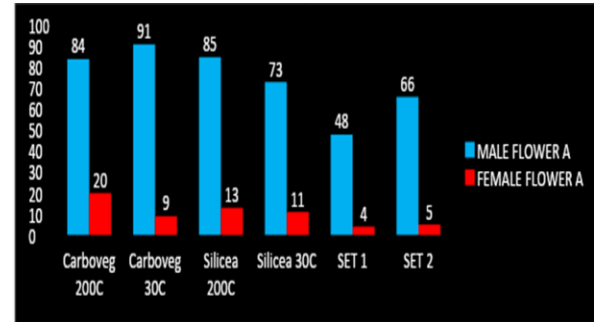
DATE	Carboveg 200				Carboveg 30				Silicea 200				Silicea 30			
	A		B		A		B		A		B		A		B	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
10/3/2020	5	2	5	1	4	1	2	2	3	3	5	1	4	2	5	1
20/3/2020	21	4	16	3	28	2	19	1	10	2	15	2	26	3	12	4
1/4/2020	28	5	20	4	25	3	15	1	15	4	12	2	29	3	14	4
21/4/2020	10	1	30	-	8	-	24	1	26	2	6	1	4	-	13	
1/5/2020	20	8	25	5	26	3	14	1	31	2	15	1	10	3	22	1

FLOWERING RATE (BOTH MALE & FEMALE) IN MEDICINALLY IRRIGATED PLANTS (IRRIGATED ONCE IN 6 DAYS):

DATE	SET 1		SET 2	
	MALE	FEMALE	MALE	FEMALE
10/3/2020	-	-	-	-
20/3/2020	7	-	15	-
1/4/2020	10	2	18	3
21/4/2020	14	1	14	1
1/5/2020	17	1	19	1

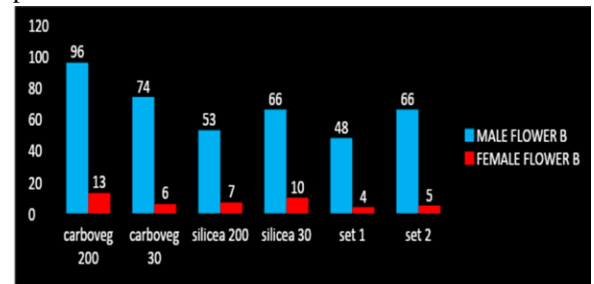
Comparison of flowering rate in plants which were both sprayed and manually irrigated with control plants (CV200A&CV30A, S200A&S30A):

Observation: Male flowering rate is more in the carbo veg 30 A which was both sprayed and manually irrigated when compared to the control plant. Flowering rate of female flowers is maximum in the carbo veg 200 A, when compared to the control plant.



Comparison of flowering rate in manually irrigated plants with control plants: (CV200B & CV30B, S200B & S30B):

Observation: Flowering rate of both male and female flowers is maximum in carbo veg 200C which was manually irrigated when compared to the control plant.

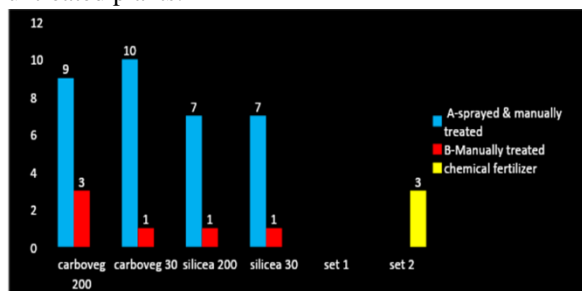


COMPARISON OF YIELD RATE IN MEDICINALLY IRRIGATED PLANTS (irrigated once in 6 days) WITH UNMEDICATED PLANTS (irrigated once in 3 days):

OBSERVATION: Total number of fruits is maximum when compared to the control sets. Among the sets, Carbo veg 30C (A) shows the maximum yields which were both sprayed & manually irrigated.

DATE	Carboveg 200C		Carboveg 30C		Silicea 200C		Silicea 30C		Set 1	Set 2
	A	B	A	B	A	B	A	B		
20/3/2020	2	-	1	-	1	-	1	-	-	-
1/4/2020	2	-	2	-	1	-	2	-	-	-
21/4/2020	2	1	3	-	2	-	2	-	-	1
1/5/2020	3	2	4	1	3	1	2	1	-	2

Comparison of yield rate in medicinally treated and untreated plants:



MOISTURE CONTENT IN THE SOIL OF MEDICATED PLANTS (in gm): It was measured on the 2nd and 5th day after irrigation.

OBSERVATION:

Irrigation was done once in 6 days. Moisture content in the soil was maximum in all the medicated sets especially in Silicea 200C when compared with the control sets 1 and 2.

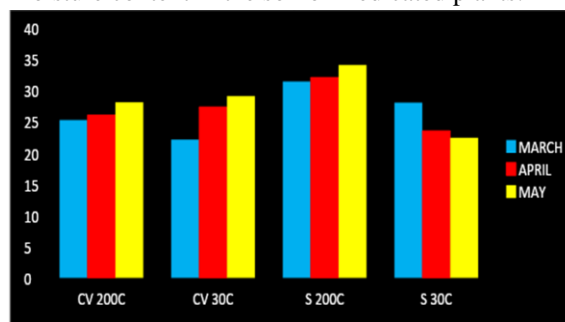
MONTH	CV 200C (SET A or B)		CV 30C (SET A or B)		S 200C (SET A or B)		S 30C (SET A or B)	
	2 <sup>ND</sup> DAY	5 <sup>TH</sup> DAY	2 <sup>ND</sup> DAY	5 <sup>TH</sup> DAY	2 <sup>ND</sup> DAY	5 <sup>TH</sup> DAY	2 <sup>ND</sup> DAY	5 <sup>TH</sup> DAY
	March(gm)	37.22	25.32	38.51	22.15	39.32	31.52	38.73
April (gm)	37.14	26.11	39.13	27.41	40.07	32.15	35.14	23.59
May(gm)	38.73	28.14	39.08	29.16	41.41	34.13	39.15	28.32

MOISTURE CONTENT IN THE SOIL OF UNMEDICATED PLANTS: Irrigation was done once in 3 days.

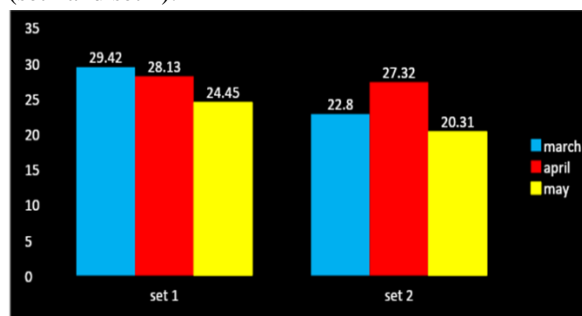
OBSERVATION: Moisture content was minimum when compared to the medicated sets of plants.

MONTH	SET 1		SET 2	
	1 <sup>st</sup> day	3 <sup>rd</sup> day	1 <sup>st</sup> day	3 <sup>rd</sup> day
March (g)	40.32	29.42	38.75	22.80
April(g)	38.15	28.13	43.13	27.32
May(g)	41.11	24.45	32.19	20.31

Moisture content in the soil of medicated plants:



Moisture content in the soil of unmedicated plants (set1 and set 2):



RELATIVE WATER CONTENT IN THE LEAF (16)(17) OF MEDICATED PLANTS WHICH WERE IRRIGATED ONCE IN 6 DAYS:

1ST MONTH:

MONTH	Tube weight(g)	Tube weight+ fresh weight(g)	Fresh weight (g)	Turgid weight (g)	Dry weight (g)	Leaf RWC (%)
Carboveg200C	16.075	19.218	3.143	3.487	2.311	70.74
Carboveg 30C	16.081	18.984	2.903	3.122	2.021	80.10
Silicea 200C	16.069	19.322	3.253	4.014	3.092	79.10
Silicea 30C	16.079	19.185	3.106	3.381	2.211	76.49

2ND MONTH:

MONTH	Tube weight (g)	Tube weight+ fresh weight(g)	Fresh weight (g)	Turgid weight (g)	Dry weight (g)	Leaf RWC (%)
Carboveg200C	16.062	18.518	2.456	3.602	2.514	72.03
Carboveg 30C	16.067	19.013	2.946	3.807	2.044	84.85
Silicea 200C	16.074	19.249	3.175	3.872	2.783	80.25
Silicea 30C	16.063	18.951	2.888	3.092	2.094	79.55

3RD MONTH :

MONTH	Tube weight (g)	Tube weight+ fresh weight(g)	Fresh weight (g)	Turgid weight (g)	Dry weight (g)	Leaf RWC (%)
Carboveg200C	16.069	19.331	3.262	3.593	2.100	77.82
Carboveg 30C	16.085	19.148	3.062	3.313	2.085	86.70
Silicea 200C	16.073	19.275	3.022	3.166	2.173	85.49
Silicea 30C	16.079	19.224	3.145	3.778	2.75	81.12

RELATIVE WATER CONTENT (RWC) IN THE LEAF OF THE CONTROL SETS (IRRIGATED ONCE IN 3 DAYS):

SET 1:

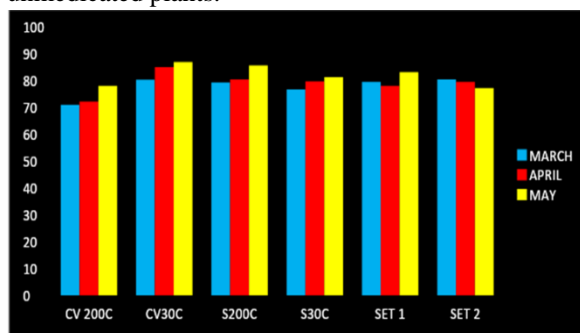
MONTH	Tube weight(g)	Tube weight+ fresh weight(g)	Fresh weight(g)	Turgid weight(g)	Dry weight(g)	Leaf RWC (%)
MARCH	16.067	18.212	2.145	2.313	1.501	79.31
APRIL	16.064	18.310	2.246	2.403	1.694	77.85
MAY	16.066	18.411	2.345	2.537	1.518	82.92

SET 2:

MONTH	Tube weight(g)	Tube weight+ fresh weight(g)	Fresh weight(g)	Turgid weight(g)	Dry weight(g)	Leaf RWC (%)
MARCH	16.065	18.317	2.252	2.458	1.412	80.30
APRIL	16.069	18.721	2.652	2.871	1.813	79.30
MAY	16.070	18.682	2.712	2.951	1.912	76.99

OBSERVATION: It was observed from the above table that medicinally treated plants show a marked variation when compared to the control sets. Among them, Maximum water content was observed in Carbo Veg 30C

Result shows that plants which were irrigated once in 3 days and once in 6 days contains almost same RWC Relative water content of both medicated and unmedicated plants:



DISCUSSION

This study was conducted on the basis of enhancing the agriculture which is one of the major livelihoods of Tamilnadu. Water scarcity is the most important factor that affects crop cultivation. We cannot grow any greens without water, but by reducing the irrigation water quantity by improving the water retaining capacity we can overcome that critical situation. In this study, the cucumber plant is used in the aim of reducing its water consumption in the agricultural field, as Tamilnadu was struggling with water scarcity. Cucumis sativus l. Belongs to the

cucurbitaceae family which is cultivated throughout India. It is a type of crop which needs large water content for its healthy growth. Avoiding these types of vegetables in our daily diet is impossible. Enhancing its growth even in stressful conditions by Agro homoeopathy is the intention of this study. In this study two Homoeopathic medicines, Carboveg and Silicea were used in two different potencies (200C & 30C).

- Seeds were soaked in Homoeopathic medicines before sowing. Seeds which were soaked in the medicine significantly reduce the duration it takes for a seed to germinate. Control sets were irrigated once in 3 days and medicinally treated plants were irrigated once in 6 days.
- Regarding the growth (length) of the plants, the medicinally treated plant grows double the height of the control plants. In agrohomoeopathy Carboveg is considered as a backbone in treatment of plants. It acts like a booster to the plants. Regarding Silicea, it helps in healthy growth of the plant. Result shows the beneficial action of silicea and carbo veg on the growth of the plant.
- Flowering rate (both male and female) of all the medicated plants was maximum when compared to the control sets and the flowers bloomed earlier than its actual time of blooming in all the medicated plants. These data shows that the duration for the development of the plant was significantly reduced, and yield was obtained earlier.
- In agrohomoeopathy, Carboveg is said to be a good plant strengthening agent which helps to prevent the plant disease and silicea can protect the plants against fungi, moulds etc. In this study, Carboveg and Silicea enhance the pesticidal action and the insecticidal action in the plants.
- Yield was obtained earlier than its actual time. Homoeopathic medicines carbo veg and silicea significantly decrease the actual duration it takes for the yield production.
- Generally reduced water supply to the plant may affect the plants in various ways in relation to water stress. But here due to Homoeopathic treatment the plants show healthy growth even in reduced water supply.

- On measuring the moisture content in the soil, all the medicated sets hold the high-water content in the soil. In agrohomoepathy it is said that the Silicea has low rate of thermal conductivity, and it changes the osmosis of the soil particle so the soil absorbs water well. The result shows the effective action of silicea in the soil and was reproved.
- On measuring the relative water content in the leaf, the value was enhanced in all the medicated plants which were irrigated once in 6 days when compared to the control sets of the plants which were irrigated once in 3 days.
- From this study the healthy growth, maturing, development, yield and pesticidal action is found increased. All the plants were grown healthier than the control sets, as they were affected. The data collected from this study shows the effectiveness of Carbo Veg 200C, Carbo Veg 30C, Silicea 200 C and Silicea 30 C in the agricultural field.
- From this study, Silicea and Carboveg enhance the water retaining capacity in the soil and plant respectively. In plant Carbo Veg acts by controlling the transpiration process and improving the condensation process, which shows its effectiveness in this field. Silicea shows its effectiveness in the soil by holding the maximum water content when compare to the other sets and control sets. As a whole, the dynamic property of the Homoeopathic drugs acts greatly in the plant.
- This study also shows the effectiveness of homoeopathic drugs on the better growth, yield and development of this vegetable crop, among which CV 30C shows a marked development. Developing stages like germination, emerging of buds, blooming of both male and female flowers and the yield occurred earlier.
- Pesticidal effectiveness was found well in all the medicated plants when compared to the control plants. Among which Silicea came up with better results. Using Homoeopathic medicines is the best and safest alternative for the harmful chemical pesticides. A lot of chemical pesticides can kill the balance of nature in various ways. This can upset the eco-system.
- Agro Homoeopathy is an inexpensive, chemical free, non-toxic method of healing and protecting the plants and agricultural resources from pests and disease. It strengthens the plant's basic structure allowing it to reach its optimum health, thus reducing and sometimes eliminating the ailments. It is essentially informational and leaves no residue in the environment. The reduction of chemicals, antibiotics and de-worming products in livestock will ensure healthier food for human consumption.

#### SUMMARY

This experimental study was done to improve the water retaining capacity of the selected high water consuming plant, cucumber, using the homoeopathic medicine Carbo Veg 200C, Carbo Veg 30C, Silicea 200C and Silicea 30 C. A significant advancement was found in all the plants which were treated homoeopathically when compared to control sets. Among them Carboveg shows the highest effective action on water retaining capacity by controlling its transpiration and condensation process.

The germination rate, growth rate, flowering rate including both male and female flowers, yield rate, moisture content of the soil, relative water content of the leaf of each set were observed, noted and compared as follows.

- #### CONCLUSION
- From the above study it is proved that the Homoeopathic dilutions of Carbo Veg and Silicea are highly effective in improving the water retaining capacity of the plant and soil and also its healthy growth.
  - From this study, the action of Carbo Veg 200C, Carbo veg 30C, Silicea 200C and Silicea 30C on increasing the water retaining capacity of the Cucumis sativus L. plant and soil were observed, all the drug shows better response when compare to the control sets, among which Carboveg30C came up to be more effective in plant and regarding soil, Silicea 200C shows a better result.
  - The germination rate was higher in all the medicated plants when compared to the control sets. Among them, germination rate was higher in the sets carbo veg 200C and carbo veg 30C.



- The growth rate (length of the shoot) was significantly higher in all the medicated sets of plants especially Carbo Veg 30C (B) has an effective action on increasing its length
- The male flowers bloomed earlier when compared to the control sets and the flowering rate was significantly enhanced by treatment with the homoeopathic medicines especially in carbo veg 30C (A) and carbo veg 30C (B).
- The female flowers bloomed earlier and the flowering rate was higher in medicinally treated plants especially in carbo veg 200C (A & B).
- Regarding the fruits, yield was obtained earlier in all the medicated sets of plants. When compared to the control sets. The yield rate was markedly higher especially in carbo veg 30C (A) when compare to the other sets
- Moisture content of the soil was enhanced in all the sets which were under the medicinal treatment, among which silicea 200 showed more improvement.
- Relative water content of the leaf of all the medicated sets which were irrigated once in 6 days were significantly higher and nearly equal to the control sets which were irrigated once in 3 days. Plants treated with carbo veg 30C showed a slight improvement than other sets.
- Regarding the pests, a significant decrease in the pest attack was observed in all the medicinally treated plants especially plants which were irrigated using both spray and manual method and have healthy leaves when compared to the control sets. Only control sets were affected by the pest.

Therefore, by this study the water retaining capacity of the cucumber plant was improved by using Carbo veg 200C, Carbo veg 30C, Silicea 200C and Silicea 30C.

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