Sand Culture

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Introduction:

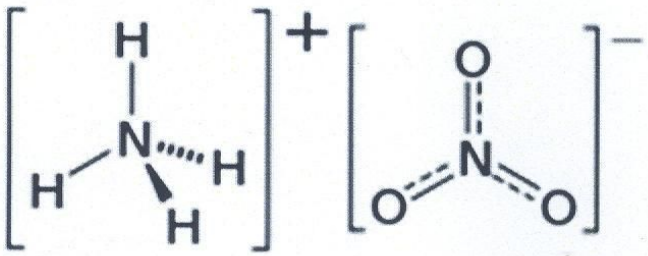
Fertilizer: is any material of natural or synthetic origin (other than liming materials) that is applied to soils or to plant tissues (usually leaves) to supply one or more plant nutrients essential to the growth of plants and it affect the yield and the plant physiology and plant growth.

*Mechanism

We did this experiment to see any items that you have a good effect on the pepper, tomatoes, but also knowing any of the items that controls growth, whether vegetative growth or syphilis. With the use of more than one type elements. Using the mechanics of fixed and fixed irrigation systems.

In this article we will focus our attention on AMMONIUM NITRATE,chahem.copper:

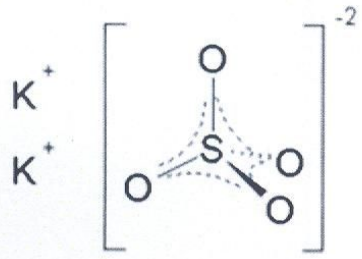
*Ammonium nitrate is an important fertilizer with the NPK rating34-0-0 (34% nitrogen).[4]
*It is less concentrated than urea(46-0-0), giving ammonium nitrate a slight transportation disadvantage.
*Ammonium nitrate's advantage over urea is that it is more stable and does not lose nitrogen to the atmosphere. During warm weather it is best to apply urea soon before rain is expected to minimize nitrogen loss.[5][6]



Ammonium nitrate: is found as a natural mineral (ammonia niter—the ammonium analogue of petered other nitre minerals such as sodium nitrate) in the driest regions of

the Atacama Desert in Chile, often as a crust on the ground and/or in conjunction with other nitrate, chlorate, iodate, and halide minerals. Ammonium nitrate was mined there in the past, but virtually 100% of the chemical now used is synthetic.

***potassium sulfate:** is a non-flammable white crystalline salt which is soluble in water. The chemical is commonly used infertilizers, providing both potassium and sulfur.



Uses: The principal use of potassium sulfate is as a fertilizer. K_2SO_4 does not contain chloride, which can be harmful to some crops. Potassium sulfate is preferred for these crops, which include tobacco and some fruits and vegetables. Crops that are less sensitive may still require potassium sulfate for optimal growth if the soil accumulates chloride from irrigation water.[6]

The crude salt is also used occasionally in the manufacture of glass. Potassium sulfate is also used as a flash reducer in artillerypropellant charges. It reduces muzzle flash, flareback and blast overpressure.

***copper: is a chemical element with symbol Cu (from Latin: *cuprum*) and atomic number 29. It is a ductile metal with very high thermal and electrical conductivity. Pure copper is soft and malleable; a freshly exposed surface has a reddish-orange color. It is used as a conductor of heat and electricity, a building material, and a constituent of various metal alloys.**

The metal and its alloys have been used for thousands of years. In the Roman era, copper was principally mined on Cyprus, hence the origin of the name of the metal as *cyprium* (metal of Cyprus), later shortened to *cuprum*. Its compounds are commonly encountered as copper(II) salts, which often impart blue or green colors to minerals such as azurite and turquoise and have been widely used historically as pigments. Architectural structures built with copper corrode to give green verdigris (or patina). Decorative art prominently features copper, both by itself and as part of pigments.

Copper is essential to all living organisms as a trace dietary mineral because it is a key constituent of the respiratory enzyme complexcytochrome c oxidase.
In molluscs and crustacea copper is a constituent of the blood pigment hemocyanin, which is replaced by the iron-complexed hemoglobin in fish and other vertebrates. The main areas where copper is found in humans are liver, muscle and bone.[2] Copper compounds are used as bacteriostatic substances, fungicides, and wood preservatives.

*-chahem(seawage pellets , sludge):

-Feces, urine, vomit, blood. Synthetic hormones, heart pills, antibiotics, illicit drugs, Viagra. Bacteria, viruses, E. coli, parasites. Household cleaners, shampoo, solvents, pesticides and traces of arsenic, mercury, cadmium, lead, dioxins and flame retardants.

Each day, this chemical cocktail is piped from our homes, businesses and industries to sewage plants across the province. The water is filtered and reclaimed.

The solid waste that remains is turned into biosolids, more commonly called sludge. For more than 30 years, Ontario's sludge has been trucked out to farmland for use as fertilizer.

Objective :

the main goal of this experiment is to know the effect of different fertilizer and nutrient on plant growth and development and yield which is done by applying and using one fertilizer on the plant and the observing and measuring the difference in plant growth between this plant and the control plant (plant without fertilizer and plant with all fertilizer) and record these difference each week.

MATERIAL AND METHOD:

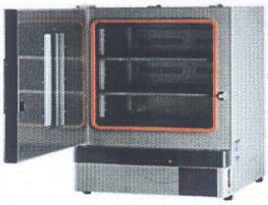
Material:

1-meter

2-caileber:

3-balance:

4-oven:



5- syringe:

6-glass bottle

method:

*in this report we carry to different experiment the first one to indicate the effect of fertilizer on plant growth the second to indicate the absence of the nutrient

-the first one :

1-we prepare to group of pots each group contain 2 pot

2- we filled these pot with sand after clearing the sand from any Plankton or large gravel

3-we put those pots under water for 48 hour in order to wash them from any chemical on salts

4- we plant tomato and pepper in each group (tomato in one pots and the pepper in the other)

5- we prepare our irrigation system over those pots to supply those plant with water

6-we prepare the fertilizer in the correct conc. By dissolving the pure fertilizer with water to produce the conc. We need to apply to plant

7- we start our exp. By supplying those fertilizer each week to the plant in the exact amount as the following:

Ammonium Nitrate 10g/L. added 10 cm3 / plant/week.-

N(Ammoniac).10cm3/plant/week-

Trace.5cm3/plant/week-

8-we take Readings each week for each plant on the following criteria :

*-we measure the number of leaves on the pepper and the number of branches on the main stem of tomato

*- we measure the number of flower and fruit on each plant (we also measure the weight of each fruit we harvested)

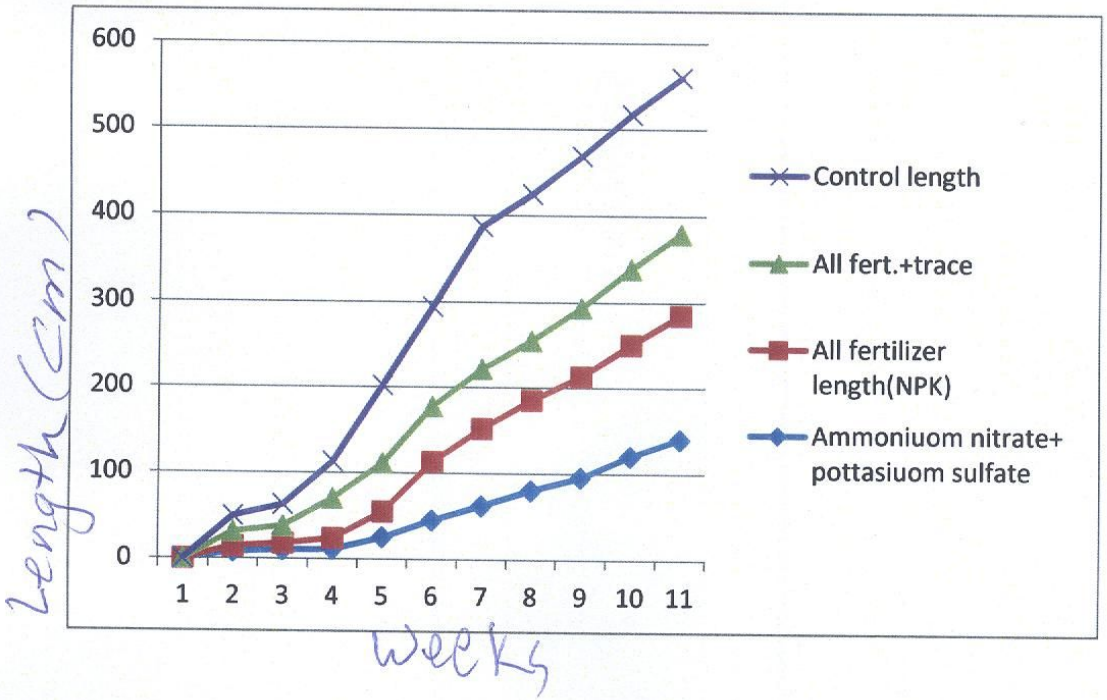
*- using a meter we measure the tall of plant in cm.

*- using Venire Caliper when we measure the diameter of the stem of each plant at the end of this experiment we cut the plant at the soil surface then measure the fresh weight then we put the plant in the oven at least 3hour /103c then we measure the dry weight .

Result:

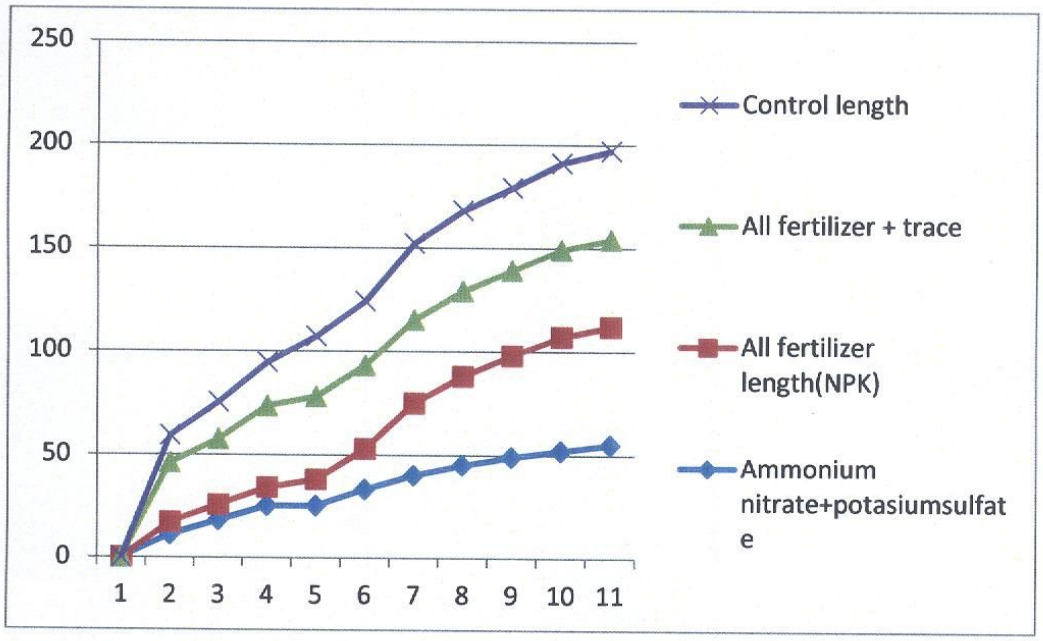
Tomato length: •

Ammoniuom nitrate+ pottasiuom sulfate	All fertilizer length(NPK)	All fert.+trace	Control length
8	6.4	17	18.5
10	8	20	25
11	13	46	43
25	30	56	91
45	68	64	117
62	90	69	166
80	105	69	170
95	118	80	175
120	130	88	179
140	145	94	181



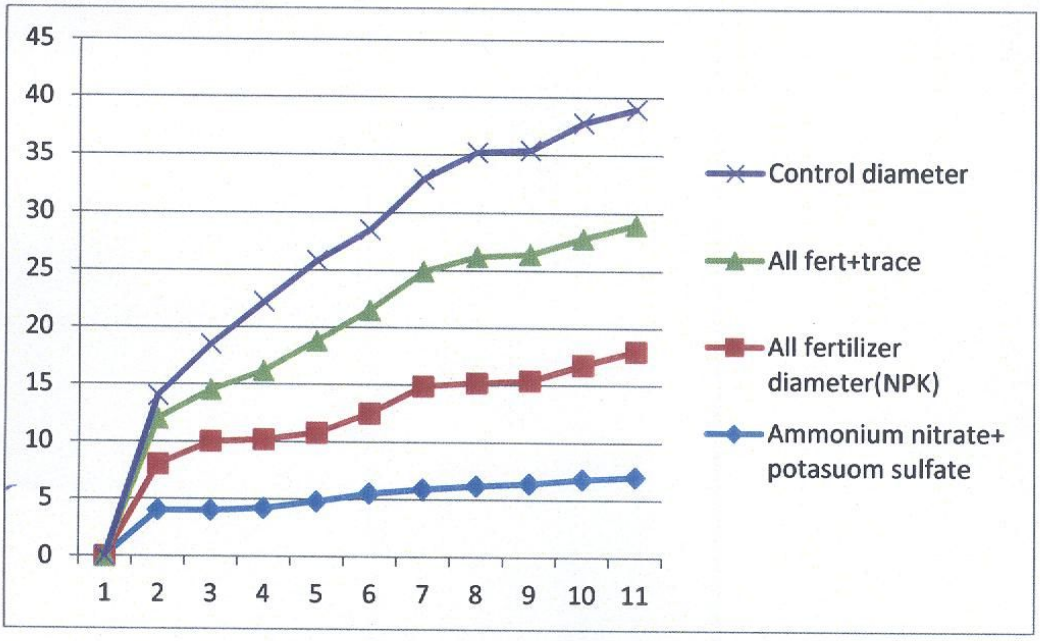
Pepper length: •

Ammonium nitrate+potasiumsulfate	All fertilizer length(NPK)	All fertilizer + trace	Control length
11	6	29	13.2
18	7.5	32	17.8
25	9	39.5	21
25	13	40	29
33	20	40	31
40	35	40	37
45	43	41	39
49	49	41	40
52	55	42	42
55	57	42	43



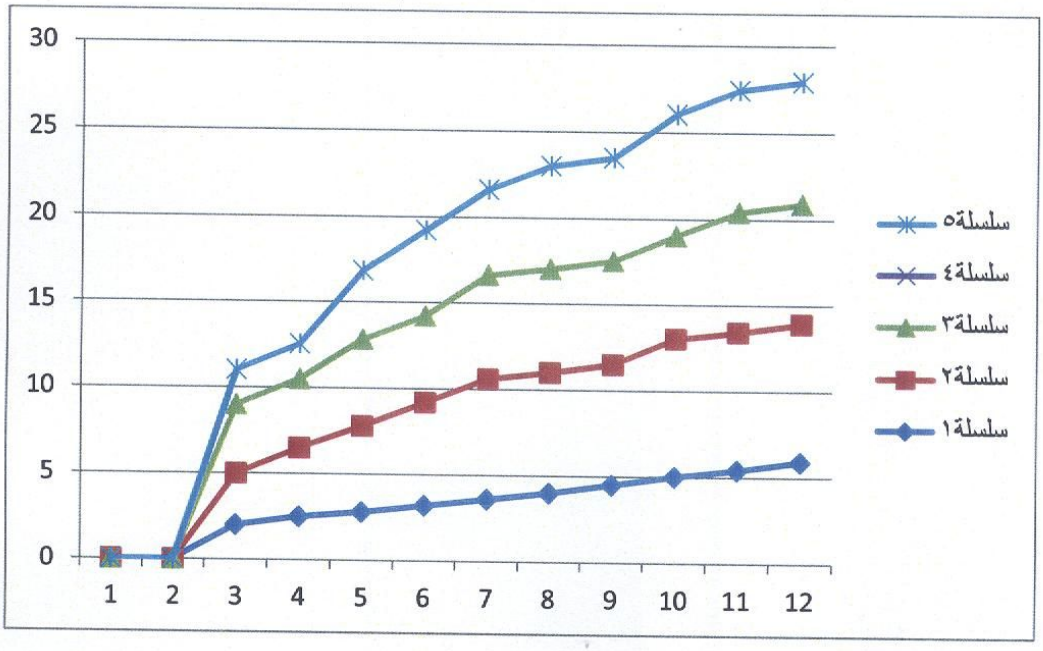
Tomato diameter: •

Ammonium nitrate+ potasuom sulfate	All fertilizer diameter(NPK)	All fert+trace	Control diameter
4	4	4	2
4	6	4.5	4
4.2	6	6	6
4.8	6	8	7
5.5	7	9	7
5.9	9	10	8
6.2	9	11	9
6.4	9	11	9
6.8	10	11	10
7	11	11	10



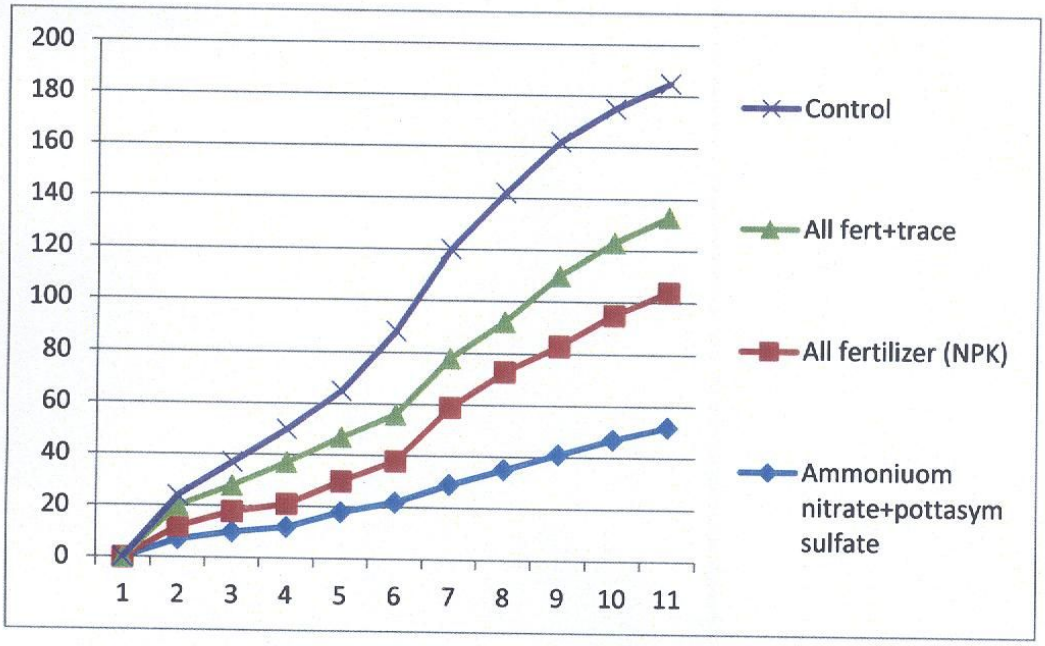
Pepper diameter: •

Ammoniuom nitrate+pottasiuom sulfate	All fertilizer diameter(NPK)	All fert+trace	Control diameter
2	3	4	2
2.5	4	4	2
2.8	5	5	4
3.2	6	5	5
3.6	7	6	5
4	7	6	6
4.5	7	6	6
5	8	6	7
5.4	8	7	7
5.9	8	7	7



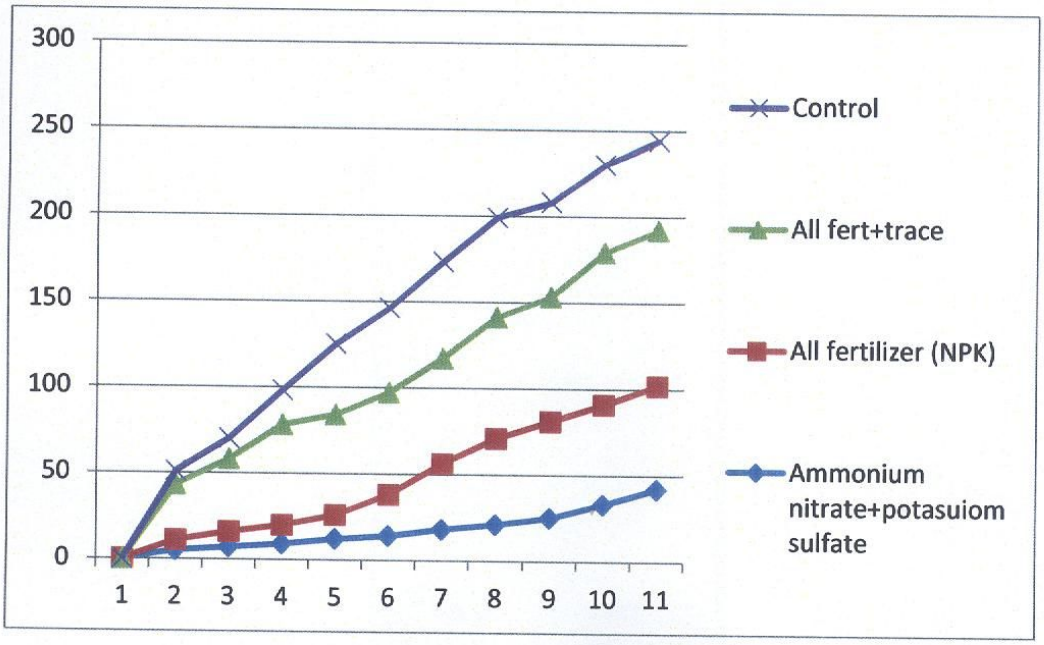
no. of leaves in tomato: •

Ammoniuom nitrate+pottasym sulfate	All fertilizer (NPK)	All fert+trace	Control
7	5	8	4
10	8	10	9
12	9	16	13
18	12	17	18
22	16	18	32
29	30	19	42
35	38	19	50
41	42	27	52
47	48	28	52
52	52	29	52



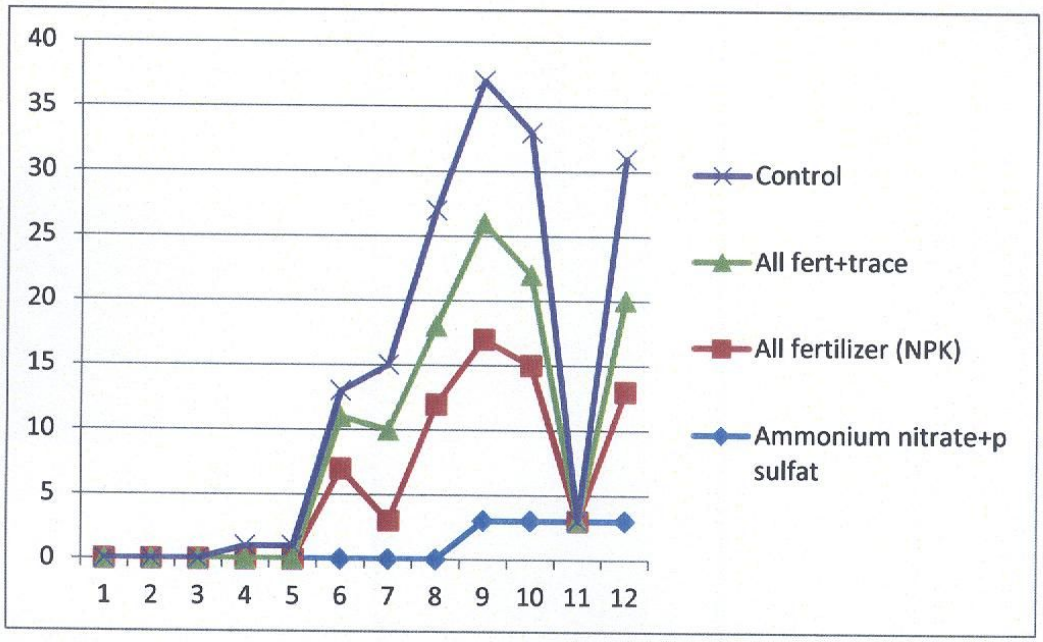
no. of leaves in pepper: •

Ammonium nitrate+potasuiom sulfate	All fertilizer (NPK)	All fert+trace	Control
5	6	32	8
7	9	42	12
9	11	58	20
12	14	58	41
14	24	59	49
18	38	61	56
21	50	70	58
25	56	72	55
33	58	88	51
42	60	90	52



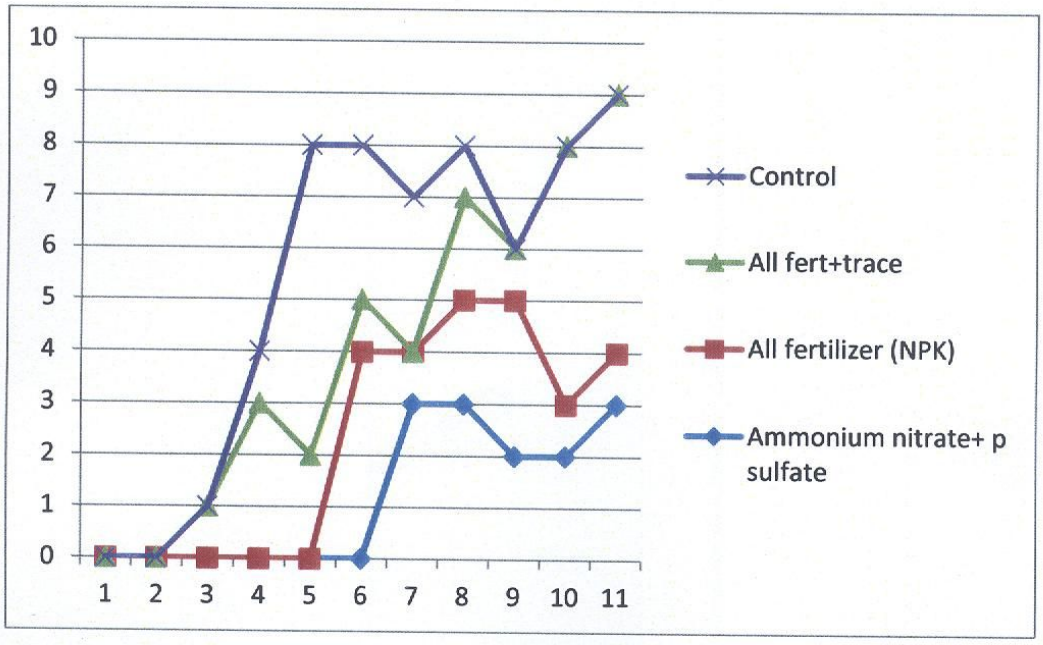
no. of flowers in tomato: •

Ammonium nitrate+p sulfat	All fertilizer (NPK)	All fert+trace	Control
0	0	0	0
0	0	0	0
0	0	0	1
0	0	0	1
0	7	4	2
0	3	7	5
0	12	6	9
3	14	9	11
3	12	7	11
3			
3	10	7	11



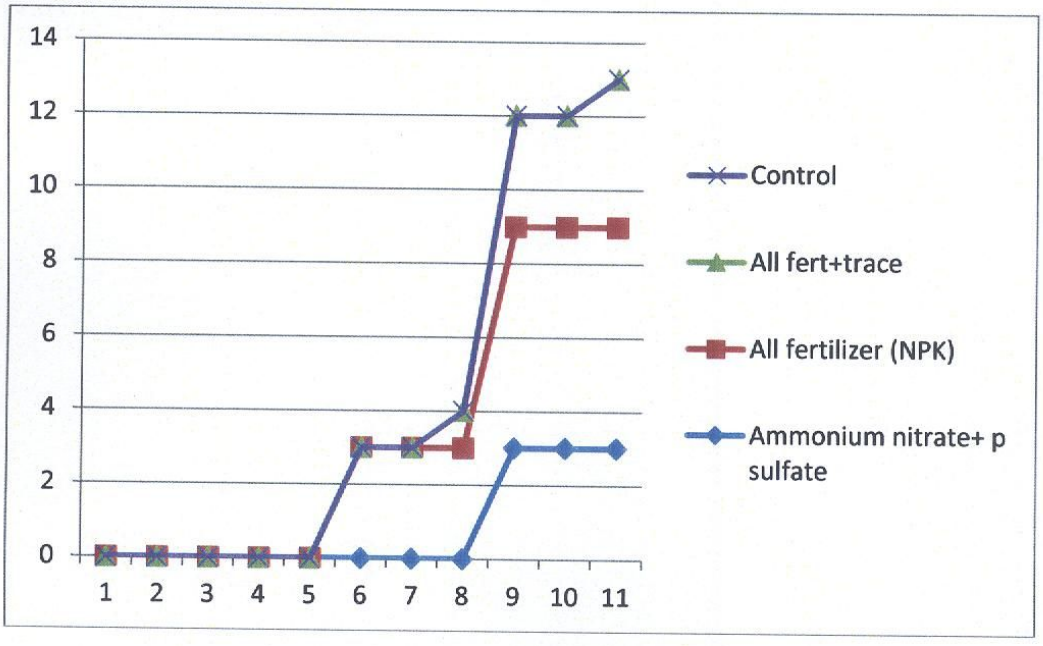
*No. of flower in pepper plant.

Ammonium nitrate+ p sulfate	All fertilizer (NPK)	All fert+trace	Control
0	0	0	0
0	0	1	0
0	0	3	1
0	0	2	6
0	4	1	3
3	1	0	3
3	2	2	1
2	3	1	0
2	1	5	0
3	1	5	0



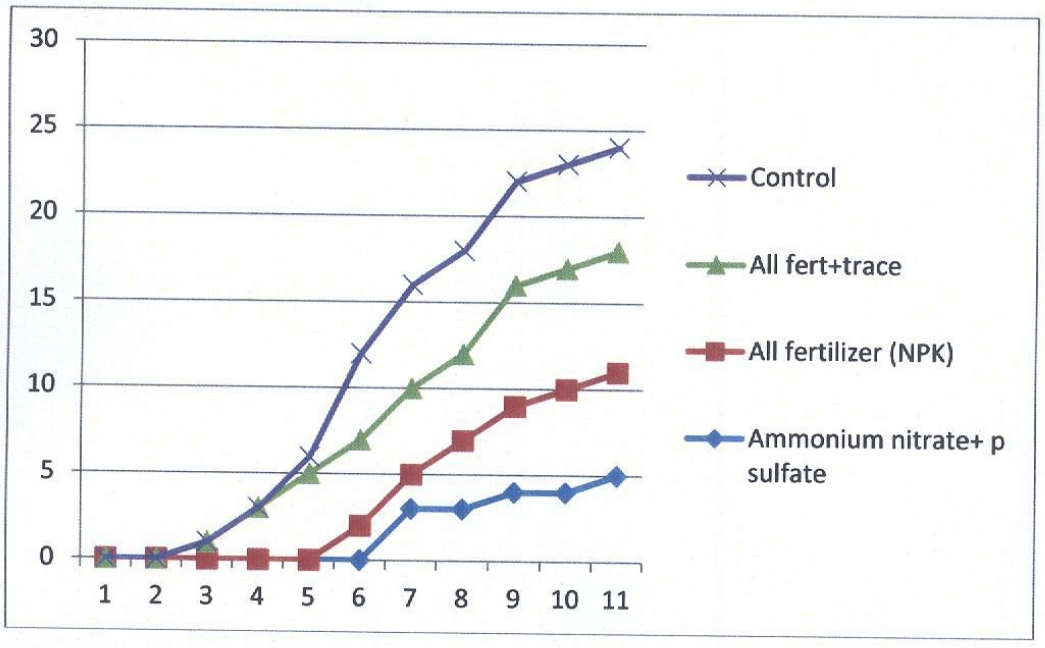
no. of fruits in tomato: •

Ammonium nitrate+ p sulfate	All fertilizer (NPK)	All fert+trace	Control
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	3	0	0
0	3	0	0
0	3	1	0
3	6	3	0
3	6	3	0
3	6	4	0



no. of fruits in pepper: •

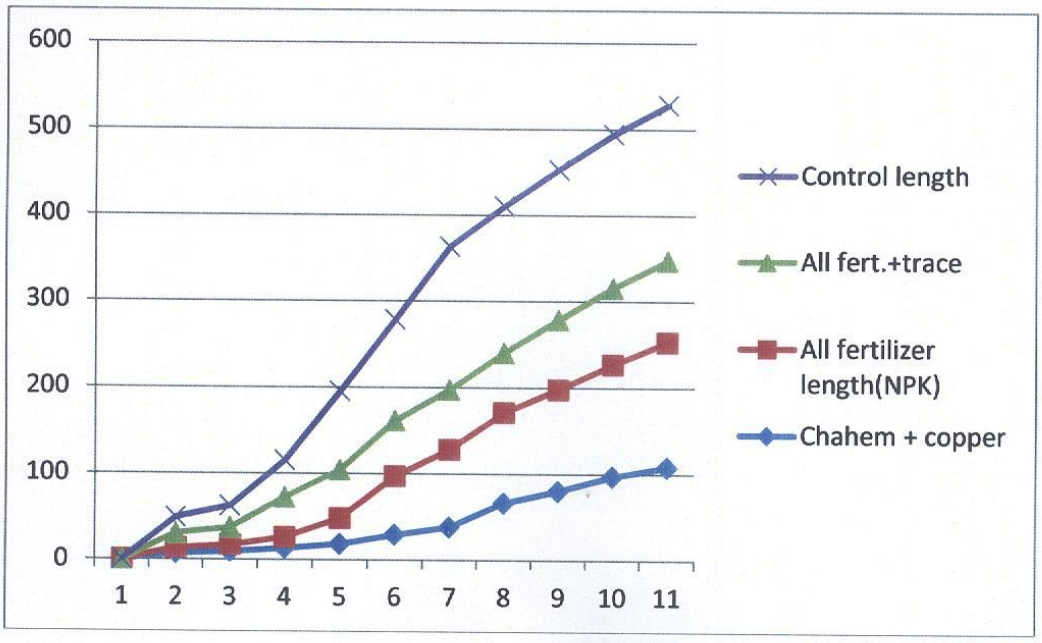
Ammonium nitrate+ p sulfate	All fertilizer (NPK)	All fert+trace	Control
0	0	0	0
0	0	1	0
0	0	3	0
0	0	5	1
0	2	5	5
3	2	5	6
3	4	5	6
4	5	7	6
4	6	7	6
5	6	7	6



Results

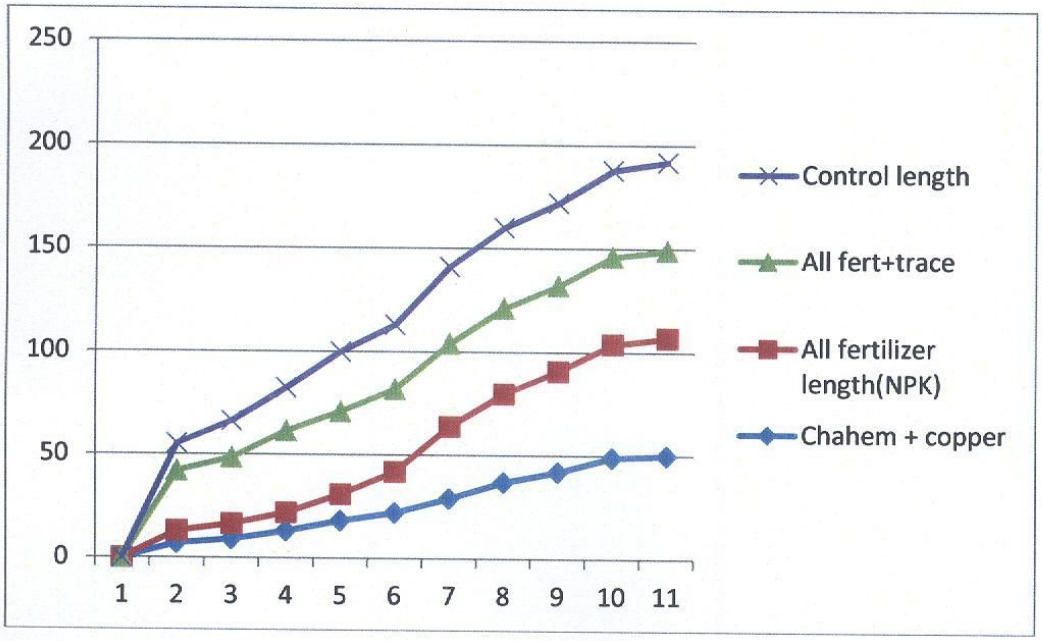
Tomato length:

Chahem + copper	All fertilizer length(NPK)	All fert.+trace	Control length
7	6.4	17	18.5
9	8	20	25
13	13	46	43
18	30	56	91
29	68	64	117
38	90	69	166
66	105	69	170
80	118	80	175
97	130	88	179
108	145	94	181



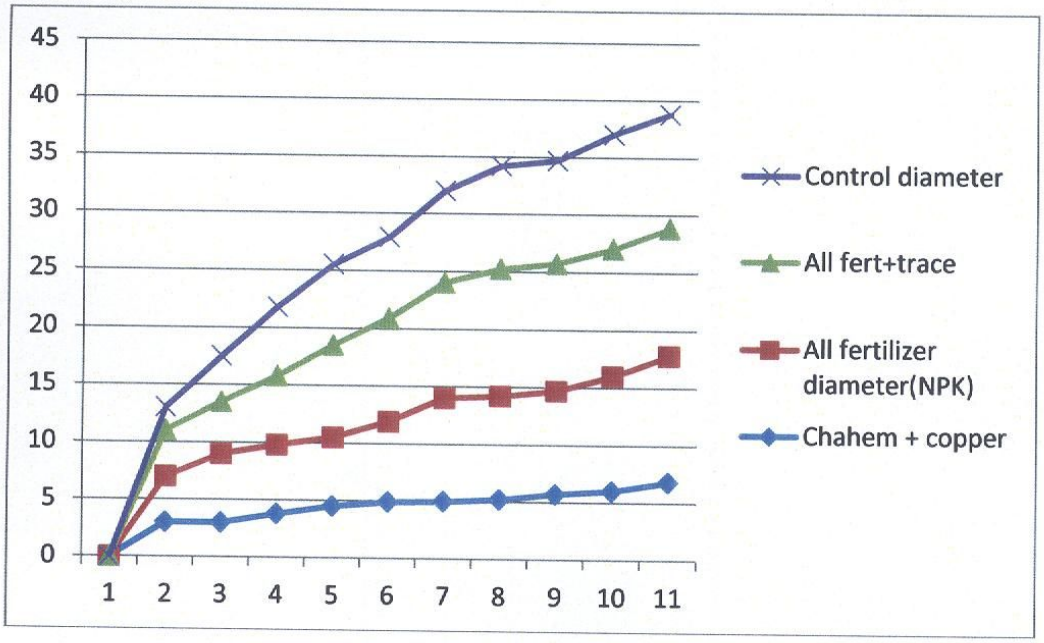
Pepper length •

Chahem + copper	All fertilizer length(NPK)	All fert+trace	Control length
7	6	29	13.2
9	7.5	32	17.8
13	9	39.5	21
18	13	40	29
22	20	40	31
29	35	40	37
37	43	41	39
42	49	41	40
49	55	42	42
50	57	42	43



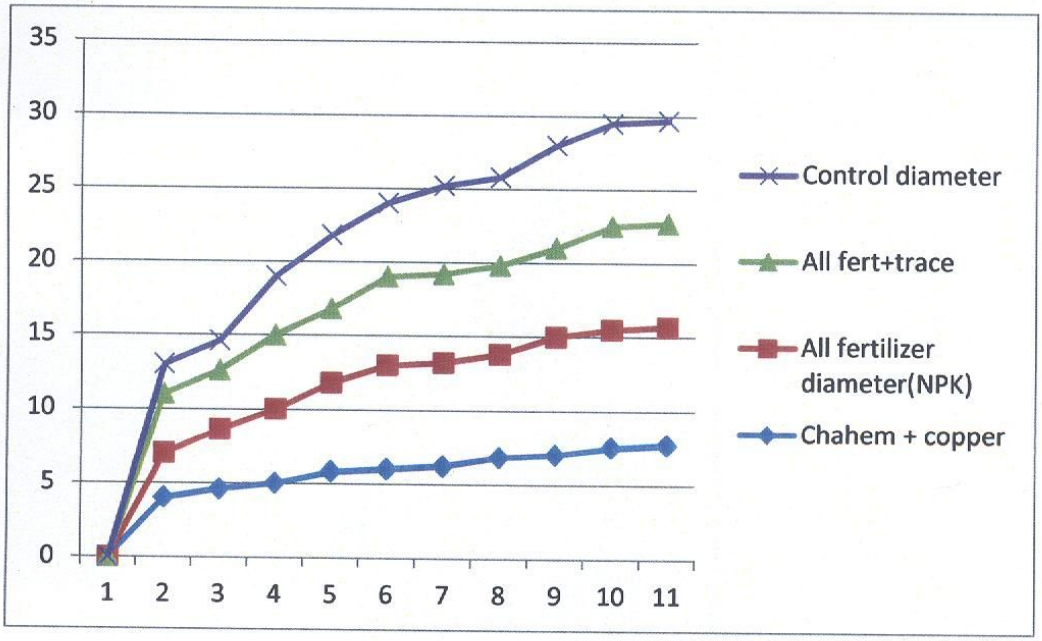
Tomato diameter: •

Chahem + copper	All fertilizer diameter(NPK)	All fert+trace	Control diameter
3	4	4	2
3	6	4.5	4
3.8	6	6	6
4.5	6	8	7
4.9	7	9	7
5	9	10	8
5.2	9	11	9
5.7	9	11	9
6	10	11	10
6.8	11	11	10



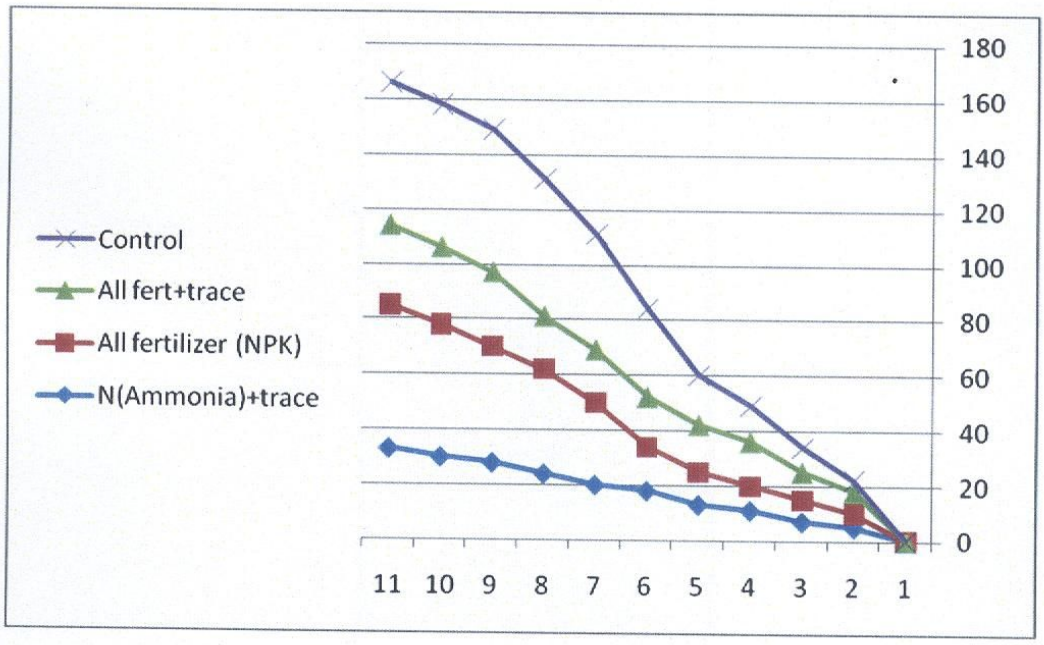
Pepper diameter: •

Chahem + copper	All fertilizer diameter(NPK)	All fert+trace	Control diameter
4	3	4	2
4.6	4	4	2
5	5	5	4
5.8	6	5	5
6	7	6	5
6.2	7	6	6
6.8	7	6	6
7	8	6	7
7.5	8	7	7
7.7	8	7	7



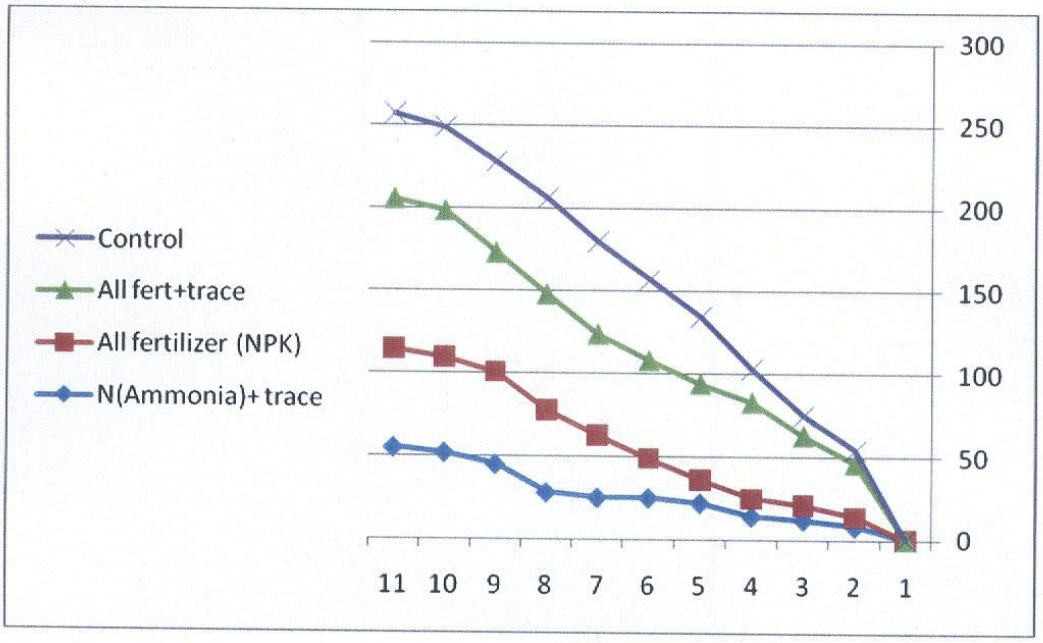
no. of leaves in tomato: •

Chahem + copper	All fertilizer (NPK)	All fert+trace	Control
5	5	8	4
7	8	10	9
11	9	16	13
13	12	17	18
18	16	18	32
20	30	19	42
24	38	19	50
28	42	27	52
40	48	28	52
48	52	29	52



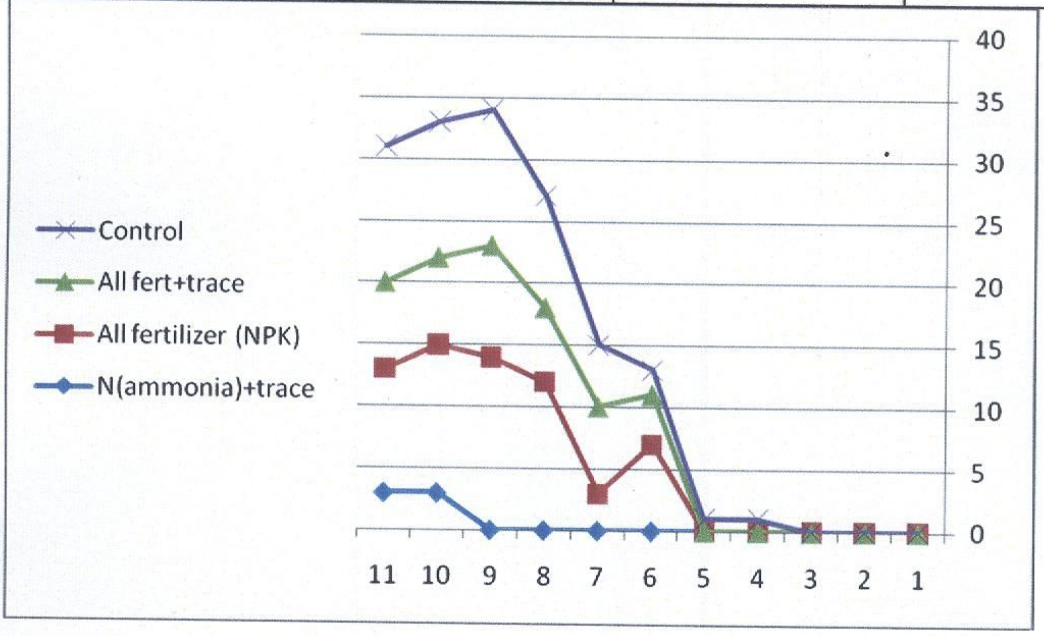
no. of leaves in pepper: •

Chahem + copper	All fertilizer (NPK)	All fert+trace	Control
8	6	32	8
12	9	42	12
14	11	58	20
22	14	58	41
25	24	59	49
29	38	61	56
35	50	70	58
45	56	72	55
52	58	88	51
62	60	90	52



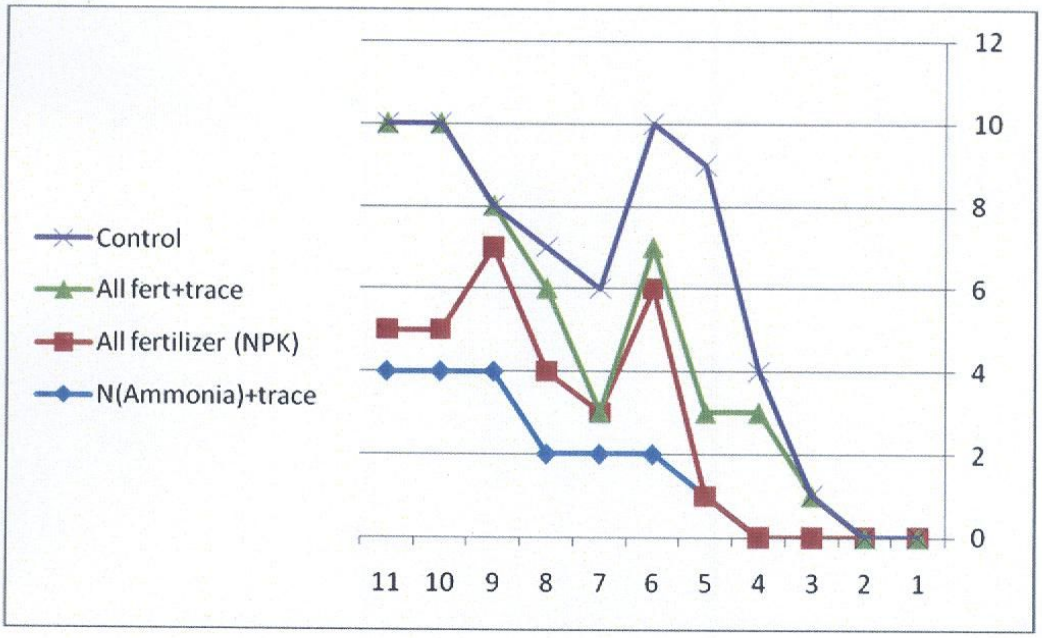
no. of flowers in tomato •

Chahem + copper	All fertilizer (NPK)	All fert+trace	Control
0	0	0	0
0	0	0	0
0	0	0	1
0	0	0	1
0	7	4	2
0	3	7	5
0	12	6	9
0	14	9	11
2	12	7	11
5	10	7	11



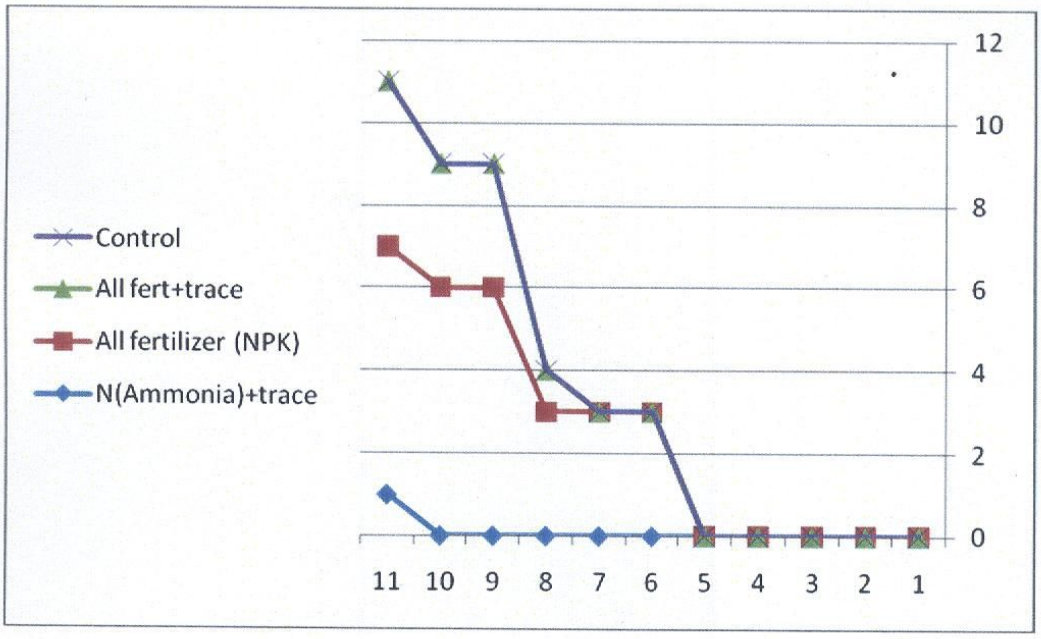
no. of flowers in pepper •

Chahem + copper	All fertilizer (NPK)	All fert+trace	Control
0	0	0	0
0	0	1	0
0	0	3	1
1	0	2	6
2	4	1	3
2	1	0	3
2	2	2	1
3	3	1	0
4	1	5	0
4	1	5	0



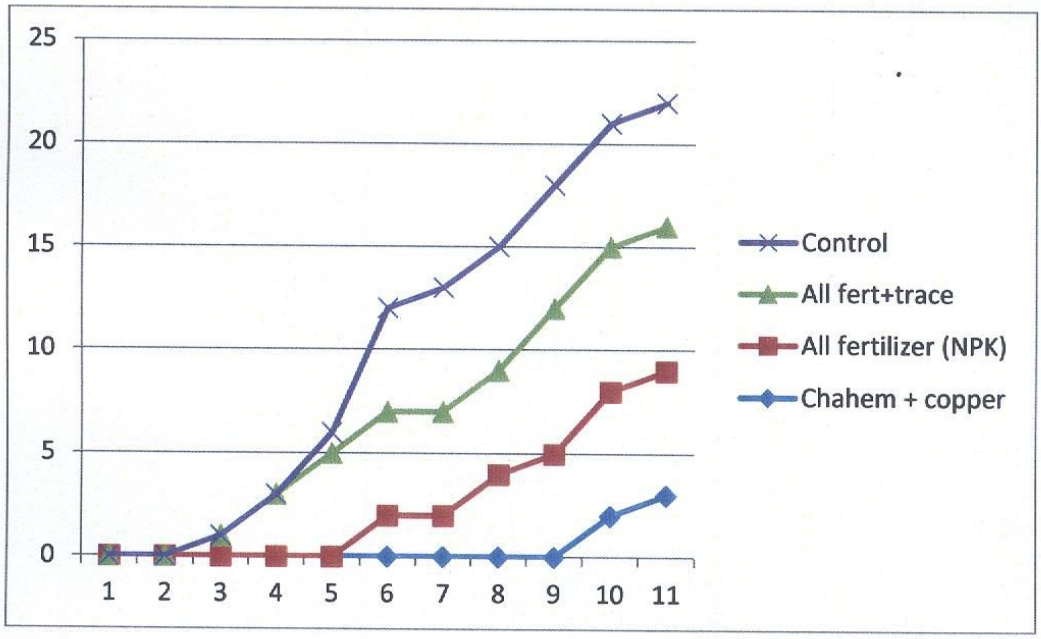
no. of fruits in tomato •

Chahem + copper	All fertilizer (NPK)	All fert+trace	Control
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	3	0	0
0	3	0	0
0	3	1	0
0	6	3	0
1	6	3	0
2	6	4	0



no. of fruits in pepper: •

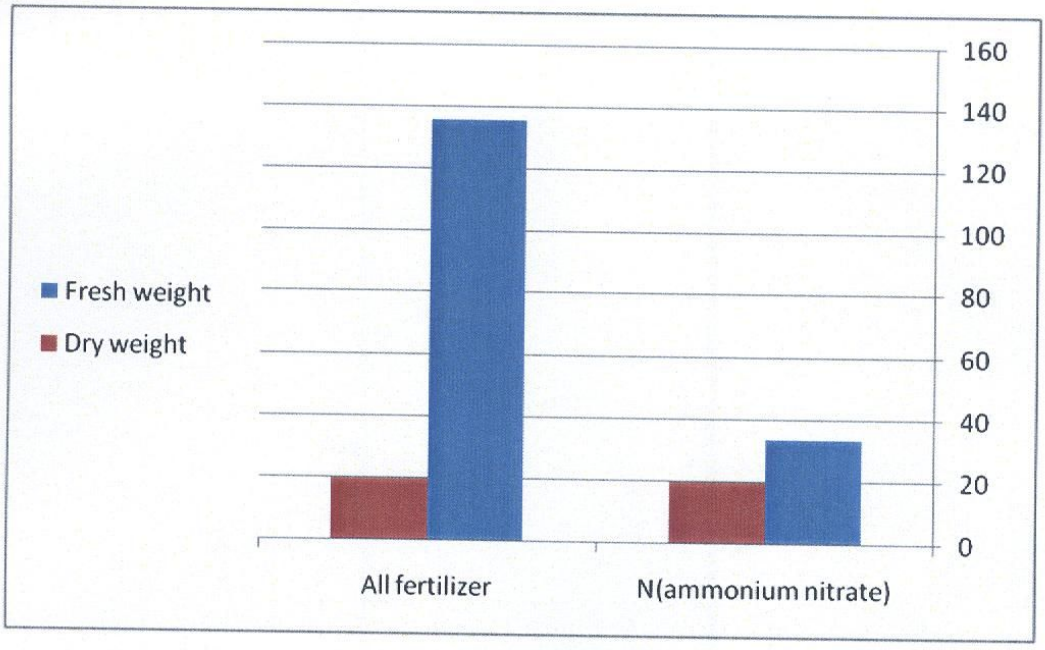
Chahem + copper	All fertilizer (NPK)	All fert+trace	Control
0	0	0	0
0	0	1	0
0	0	3	0
0	0	5	1
0	2	5	5
0	2	5	6
0	4	5	6
0	5	7	6
2	6	7	6
3	6	7	6



Result:

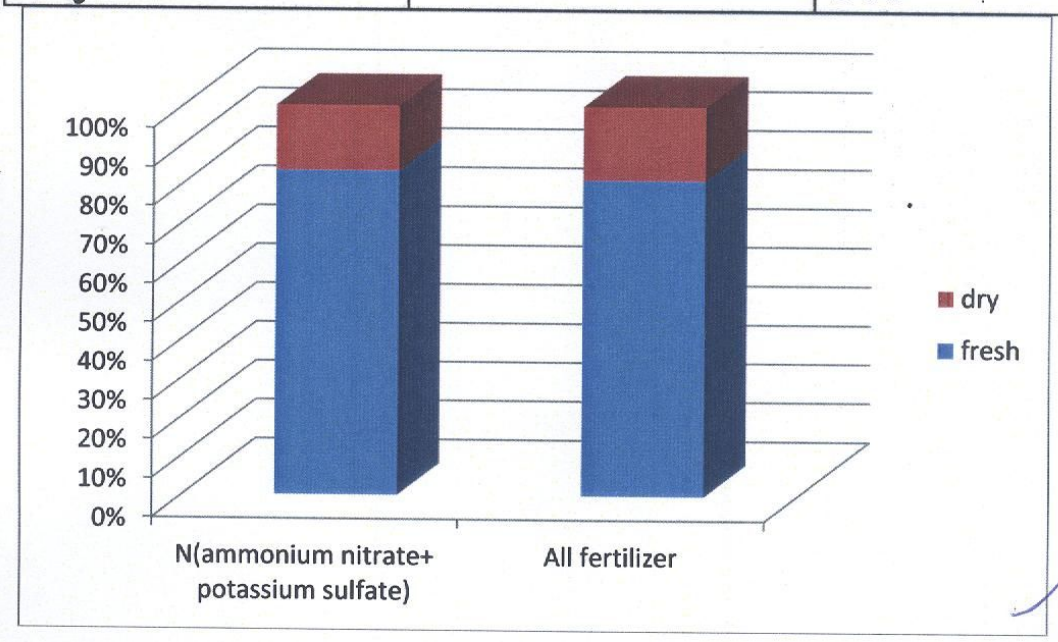
*tomato plant:

Weigh t	N(ammoniu m nitrate+ potassium sulfate)	All fertilizer
Fresh weight	55	135
Dry weight	31	20.1



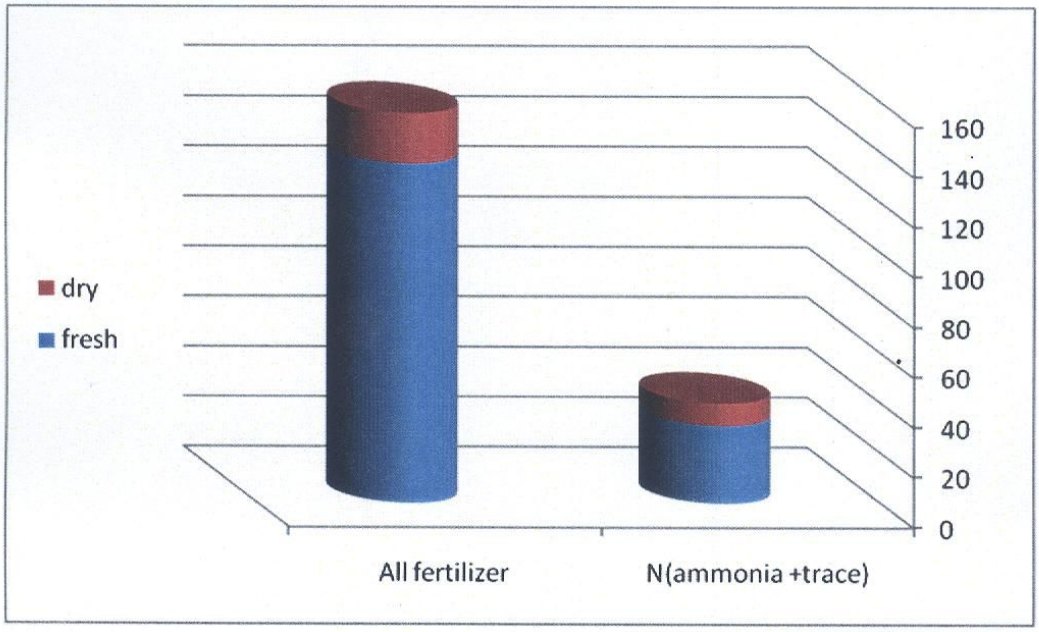
*Pepper plant:

weight	N(ammonium nitrate+ potassium sulfate)	All fertilizer
fresh	35	24.9
dry	7	5.8



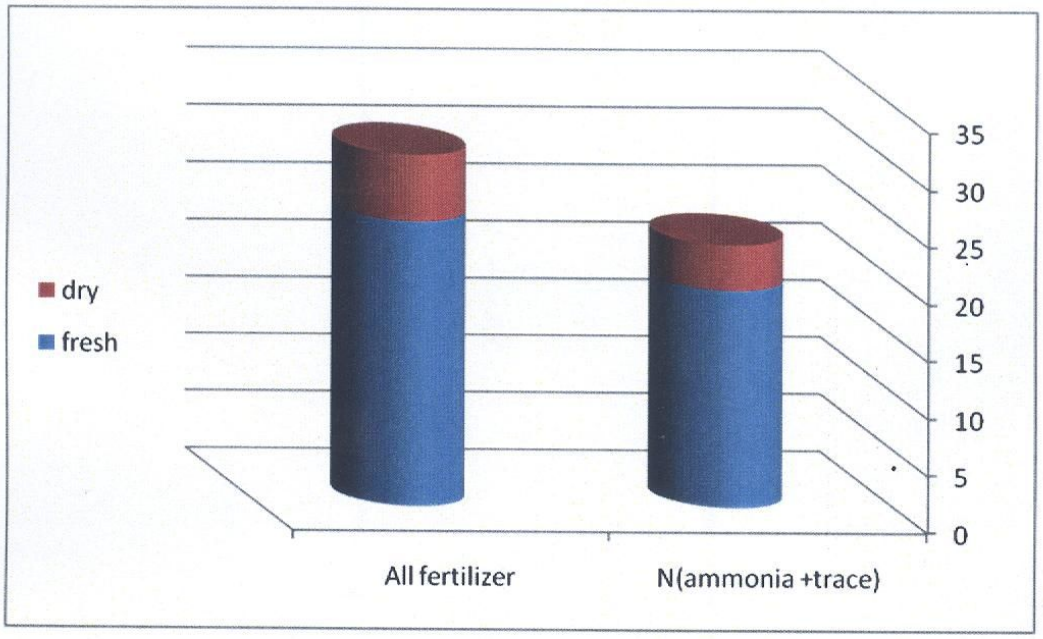
*Tomato plant:

weight	Chahem + copper	All fertilizer
fresh	25	135.5
dry	5	20.1



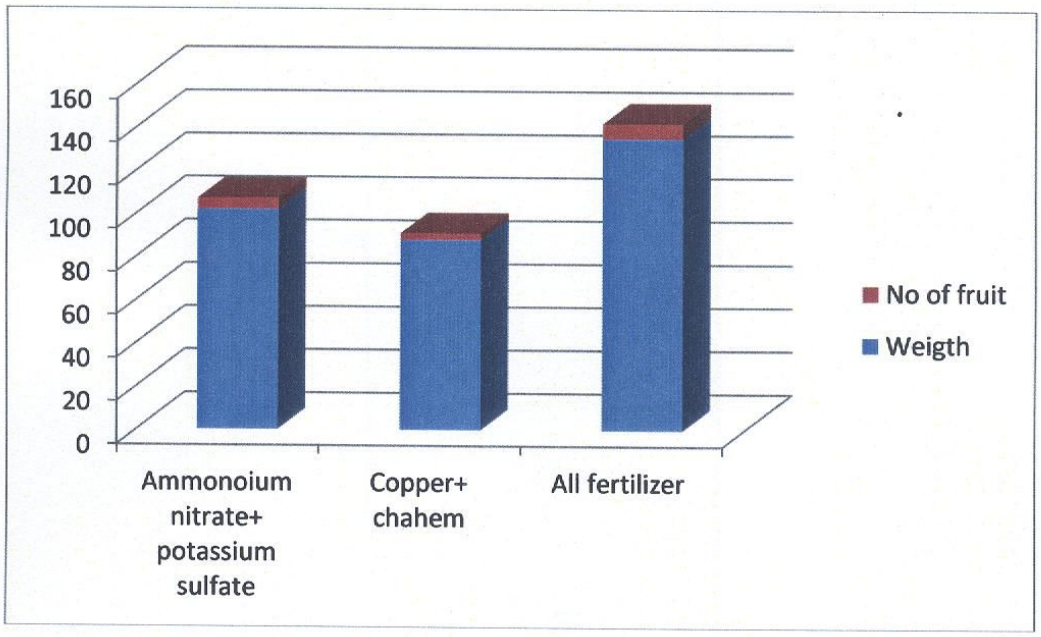
*Pepper plant:

weight	Chahem + copper	All fertilizer
fresh	25	24.9
dry	7	5.8

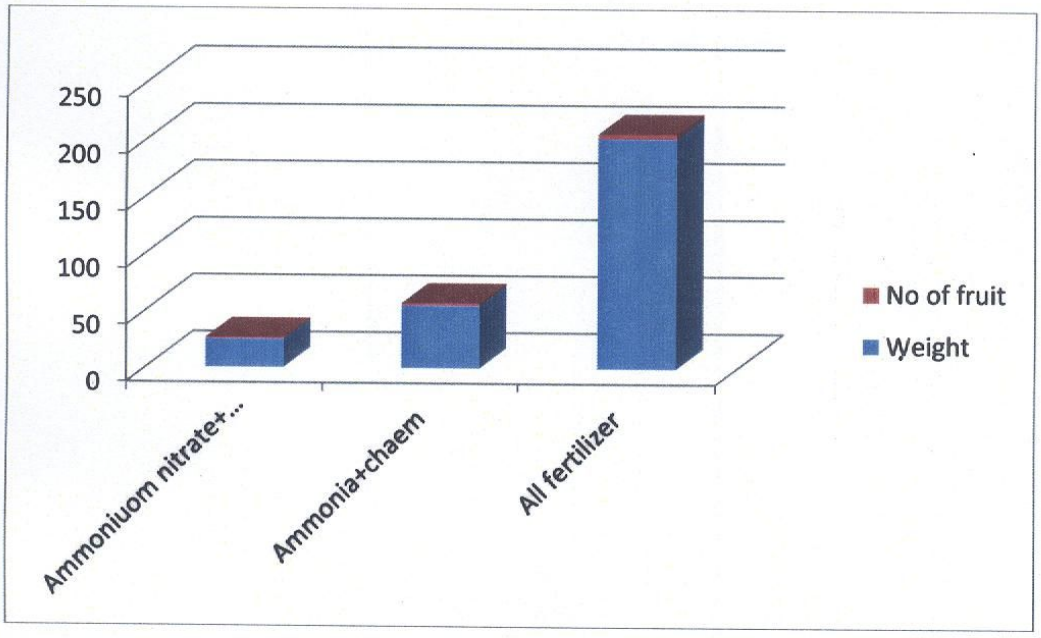


Result:

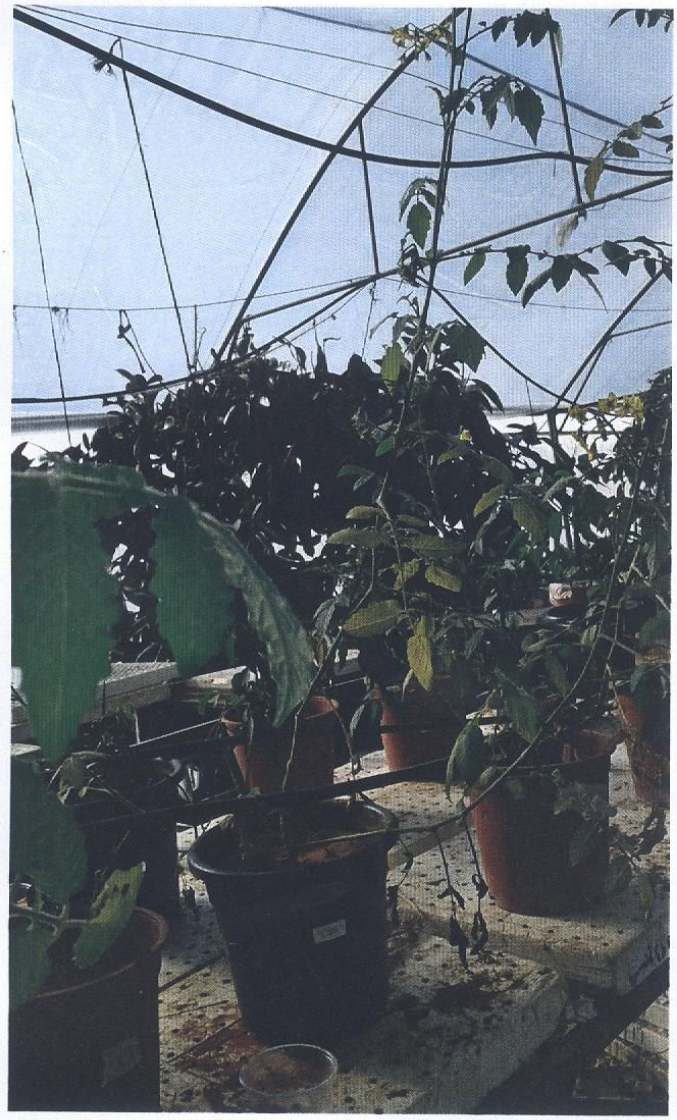
Fruit pepper	Ammonoium nitrate+ potassium sulfate	Copper+ **chahem**	All fertilizer
Weigth	102	88	135.2
No of fruit	5	3	7

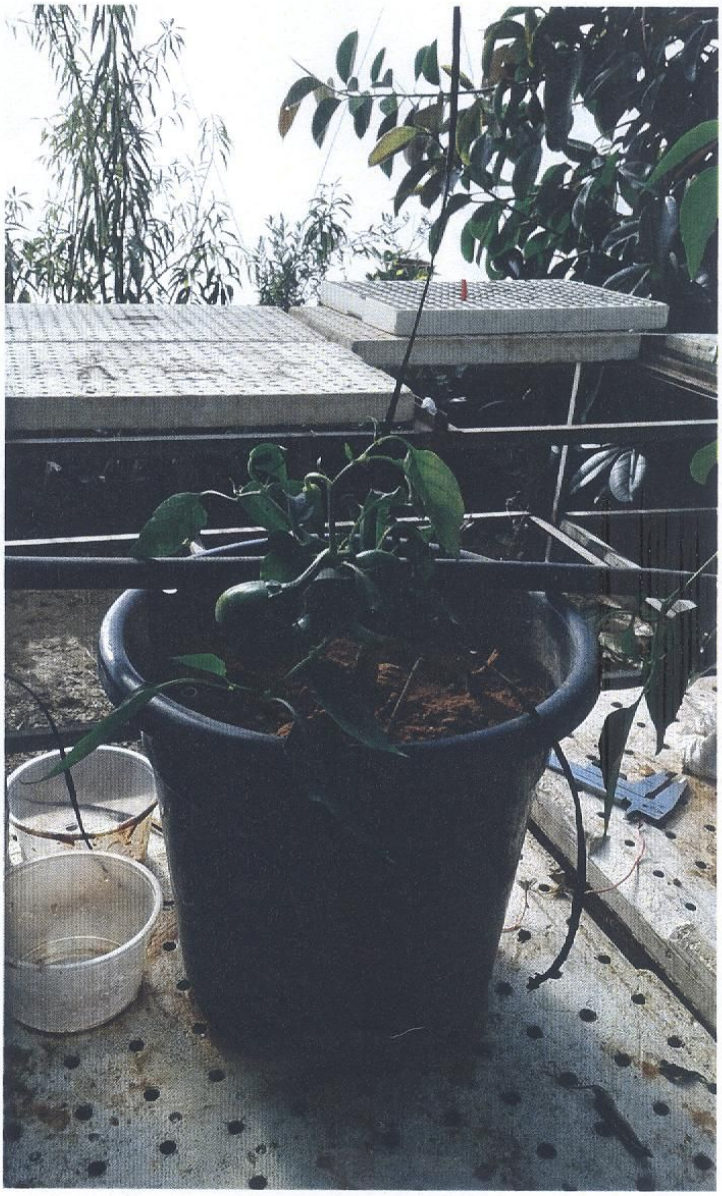


Fruit of tomato	Ammoniuom nitrate+ potassium sulfate	Ammonia+chaem	All fertilizer
Weight	25	55	202.4
No of fruit	1	2	4



Result (picture):





conclousion:

Our analysis of the experiment on transplant of tomato and transplant of pepper when adding different fertilizer each as when adding chahem and adding cu + ammonioum nitrate and potassium sulfate to experiment control to transplant of tomatoes and peppers have noticed that both the length and the diameter and number of flowers, leaves and fruits are different from Add chacem for transplant of tomatoes and peppers the others as each of them has an impact on tomatoes pepper and noticed that he appeared deficiency symptoms on some papers and because of a defect in the drain or the problems of the control or that some fertilizer additives affect the length, diameter and number of fruits and leaves.