تأثير الأسمدة على البندورة والفلفل

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Introduction:

*__Plant Nutrition__: is the study of the chemical elements and compounds that are necessary for plant growth, and also of their external supply and internal metabolism. Two criteria defined for an element to be essential for plant growth:

*__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.

Trace:

Inanalytical chemistry, atrace elementis anelementin a sample that has an averageconcentrationof less than 100parts per millionmeasured in atomic count or less than 100 micrograms per gram.

Inbiochemistry, atrace elementis adietary mineralthat is needed in very minute quantities for the proper growth, development, and physiology of the organism.[1]

Ingeochemistry, atrace elementis a chemical element whose concentration is less than 1000ppmor 0.1%of arock's composition. The term is used mainly inigneous petrology. Trace elements will either prefer liquid or solid phase. If compatible with a mineral, it will prefer a solid phase (e.g., Ni compatible with Olivine). If it is incompatible with an element it will prefer a liquid phase. The measurement of this ratio is known as the partition coefficient. Trace elements can be substituted for network-forming cations in mineral structures. Minerals do not have to contain trace elements, i.e., they

do not have to appear in the mineral's chemical formula. When practicing biodynamic farming it is important to utilize the trace elements of the soil, in order to give strength to the roots. Hydroponic practices however are decreasing the seed germination rate, causing an increase in pollution and waste

-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.

Advantages : Application of sewage sludge to agricultural land may be beneficial because it can improve the physical, chemical and biological properties of soils which may enhance crop growth.and also high nutrition content

-NPK 11-8-22

NPK fertilizers are three-component fertilizers providing nitrogen, phosphorus, and potassium. NPK rating is a rating system describing the amount of nitrogen, phosphorus, and potassium in a fertilizer. NPK ratings consist of three numbers separated by dashes (11-8-22) describing the chemical content of fertilizers , The first

number represents the percentage of nitrogen in the product; the second number, P2O5; the third, K2O.

11-8-22 mean that every 100g of this fertilizer contain 11%N 8%P2O5 22%K2O

Those 3 element being essential in plant nutrition. they are the main nutrients required in the development of healthy, productive plants.

-Nitrogen

nitrogen is largely responsible for the growth of leaves on the plant. Its availability in the soil depends on factors including the temperature and moisture of air and soil, the composition and condition of soil, and the activity level of soil organisms

advantages :

1-helps plants grow quickly,
2-important for protein synthesis since Nitrogen is an essential element of all amino acids. Amino acids are the building blocks of proteins.
3- increasing the production of seed and fruit,
4-bettering the quality of leaf and forage crops.
4-Nitrogen is also a component of chlorophyll,the substance that gives plants their green color,
5- and also aids in photosynthesis.
7- protoplasm synthesis
8-affect water and nutrient uptake (since they found in protein and enzyme)
9-Nitrogen is also a component of nucleic acids, which form the DNA of all living things and holds the genetic code.

deficiency :Nitrogen deficiency shows up in the yellowing or chlorosis of the plant leaves. The yellowing will start in the oldest leaves, and then will proceed to develop on younger leaves if the deficiency continues. Plants will typically be shorter or stunted and grow slower than plants with sufficient Nitrogen. Nitrogen stress also reduces the amount of protein in the seed and plant. Tillering can also be reduced in small grains. A Nitrogen deficiency can also affect the standibility of crops as grain fill occurs. If a plant is deficient in Nitrogen, it will draw Nitrogen out of the leaves and stalk for grain fill. This will weaken the stalk or stem causing standability problems.

Phosphorus

Phosphorus is largely responsible for root growth and flower and fruit development. Most soil P occurs in relatively insoluble minerals and organic matter in the soil. The availability of these forms is very sensitive to soil pH. Phosphorus availability can be reliably estimated with soil tests. Phosphorus can be lost from the soil. Loss is primarily through erosion of soil particles and organic matter containing P and loss of soluble P in runoff from soils with very high P levels at the surface. Phosphorus lost to water can be an environmental threat.

Advantages :

1-critical component of nucleic acids, so it plays a vital role in plant reproduction, of which grain production is an important result.
2-Considered essential to seed formation,
3-this mineral is often found in large quantities in seed and fruit.
4-Phosphorus is essential for the biological energy transfer processes that are vital to life and growth.
5-improved crop quality,
6-greater straw strength,
7- increased root growth, and promotes blooming.
8-earlier crop maturity.
9-a key player in the photosynthesis process,
10. Phosphorus supports the formation of oils, sugars, and starches.
11-and the ability to withstand stress.

Phosphorus deficiency: is indicated by reduced plant growth, delayed maturity, and small fruit set. These symptoms may be accompanied by a purple coloring, particularly in young plants. Like nitrogen, phosphorus is mobile in the plant; therefore, any deficiency symptoms show up first on older leaves.

Potassium

Potassium is a nutrient that helps the overall functions of the plant perform correctly

Potassium (K) is not an integral part of any major plant component, but it does play a key role in a vast array of physiological processes vital for plant growth, from protein synthesis to maintenance of plant water balance.

Potassium isthe third essential nutrient plants demand,

Advantages:

1- assists in photosynthesis,
2- fruit quality, (enhances the size and quality of fruits and vegetable)
3-the building of protein,
4-and the reduction of disease.
5- resist drought
6- controls plant stomata(opening and closing) and controls cell turgidity.
7- aids the enzymes promoting plant life

Potassium deficiency :is characterized by reduced plant growth and a yellowing and/or burning of leaf edges. they have symptoms such as stunted growth, poor flower development and lower quality fruit or vegetable harvests. Plant leaves may look scorched and curl at the tips. As potassium-deficient plants grow, the leaves curl along the edges and often appear dry, white-spotted or crinkled at the edges. Growth is slow, and wind or high temperatures easily damage the plants Since potassium is mobile in the plant, the symptoms appear on the older leaves first. Another indication of potassium deficiency is reduced straw or stalk strength, which results in lodging problems, reduced disease resistance, and reduced winter hardiness of perennial or winter annual crops

Knowing the NPK values of a fertilizer can help you select one that is appropriate for the type of plant you are growing. For example, if you are growing leafy vegetables, you may want to apply a fertilizer that has a higher nitrogen number to encourage leafy growth. If you are growing flowers, you may want to apply a fertilizer that has a higher phosphorus number to encourage more blooms.

*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.

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
in this report we test the effect of trace +chahem and NPK 11-8-2 +chahemon tomato and pepper growth and in water culture we test the absence of phosphor.

Materials :

- pots
- Source of water
- different nutrient solutions prepared during first lab
- Caliber
- Meter
- sandy soil
- Oven
- Balance
- Syringes.

-Method:

We done the experiment by many steps around the semester as follow:

Preparing the plastic pots:

- At first we take the plastic pots and clean it, and put the plastic bags in it, then
- We full it by sand, and hold it in metal shelf in the nursery.
- We install the drip irrigation system.
- We wash the sand by water to leach the nutrient a continuous irrigation for about one week.
- We cultivation the transplants in sand and take the first measure.
- We add the dianon with irrigation water.

✓ Note: we use fourpots(we cultivate four plant).

Adding the fertilizers:

trace 10 cm3/plant /week + chahem 20g/plant/week on the first group
NPK 11-8-22 10 cm3/plant /week +chahem 20g/plant/week on the second group

Collecting data and measures:

- We collect the data and measures every week (the data that we collect it as the follow: -
  - Plant length.
  - Stem diameter.
  - Number of leaves.
  - Number of flowers.
  - Number of fruit .

result:

we tack reading each week the reading we tack (tall ,diameter ,number of flower and leave and fruit ,and fresh and dry and fruit weight)

first group

-trace +chahem:

-tarce 5 cm²/plant /week

-chahem (20 g / plant / week)

second group

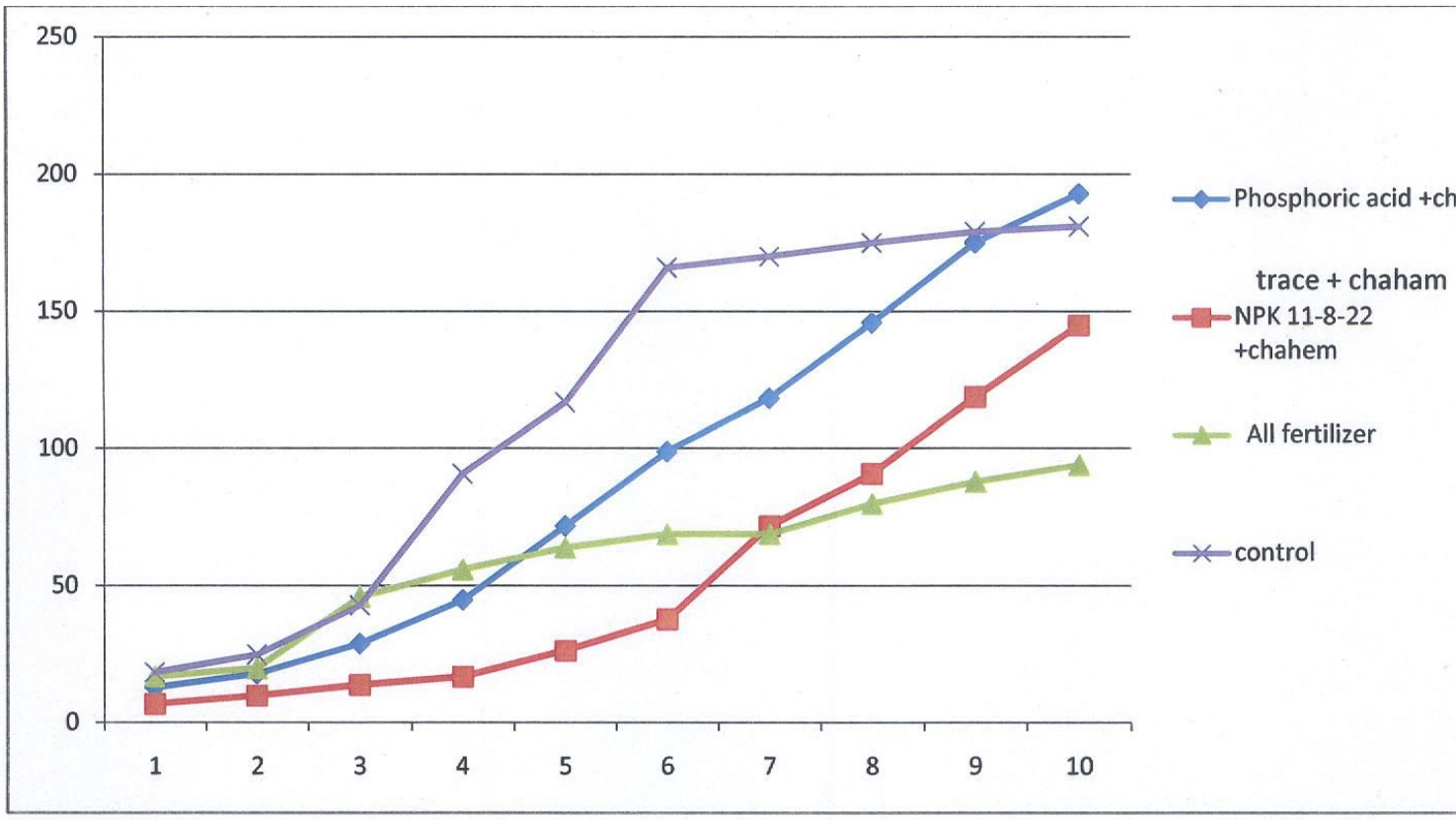
-we add NPK 11-8-22+chahem:

NPK 11-8-22 (10cm3/plant/week)

chahem (20g/plant /week)

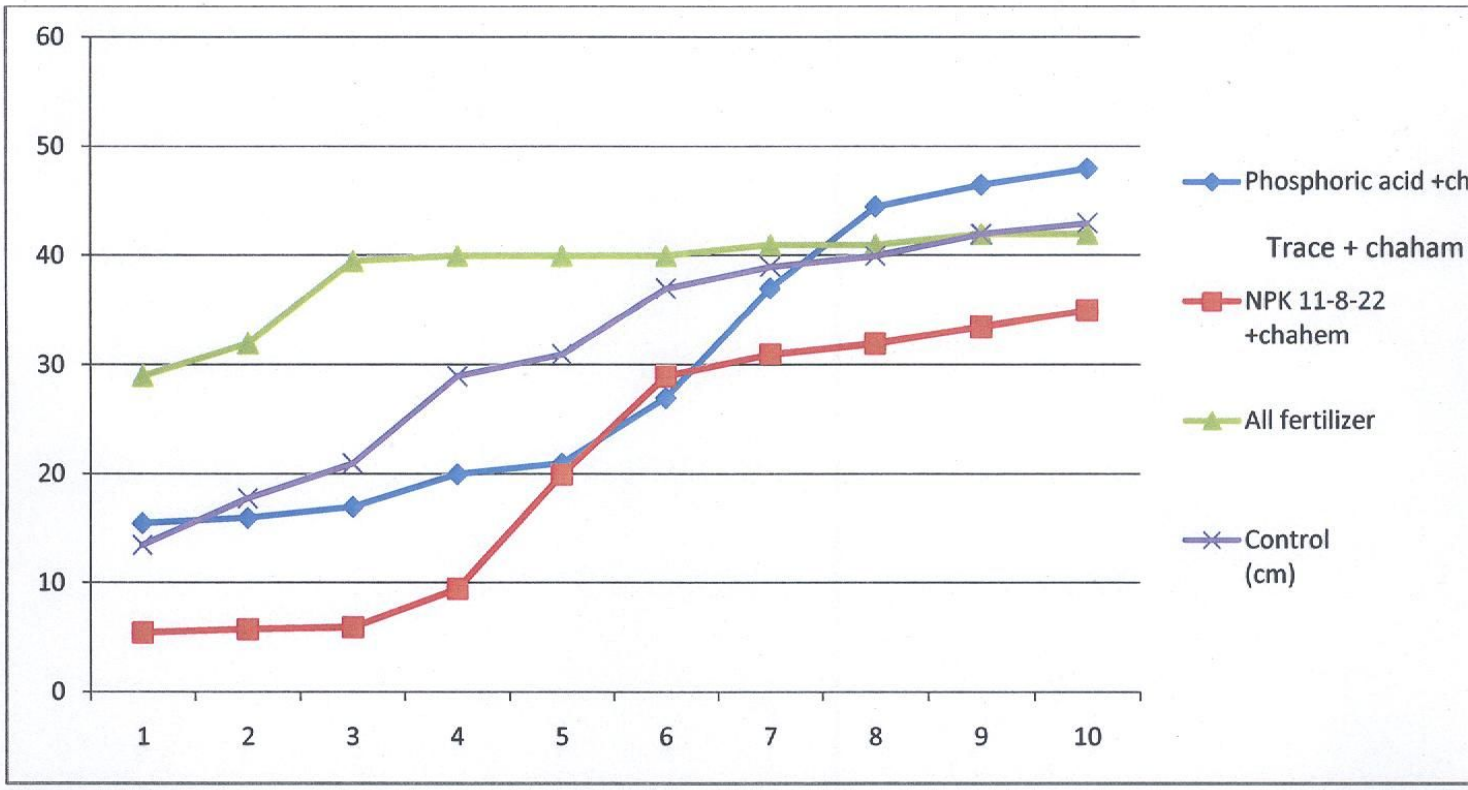
Tomato length (in cm)

week	trace +chaham	NPK 11-8-22 +chaham	All fertilizer	Control
1	13 cm	7 cm	17 cm	18.5 cm
2	18 cm	10 cm	20 cm	25 cm
3	29 cm	14 cm	46 cm	43 cm
4	45 cm	17 cm	56 cm	91 cm
5	72 cm	26.5 cm	64 cm	117 cm
6	99 cm	38 cm	69 cm	166 cm
7	118.5 cm	72 cm	69 cm	170 cm
8	146 cm	91 cm	80 cm	175 cm
9	175 cm	119 cm	88 cm	179 cm
10	193 cm	145 cm	94 cm	181 cm



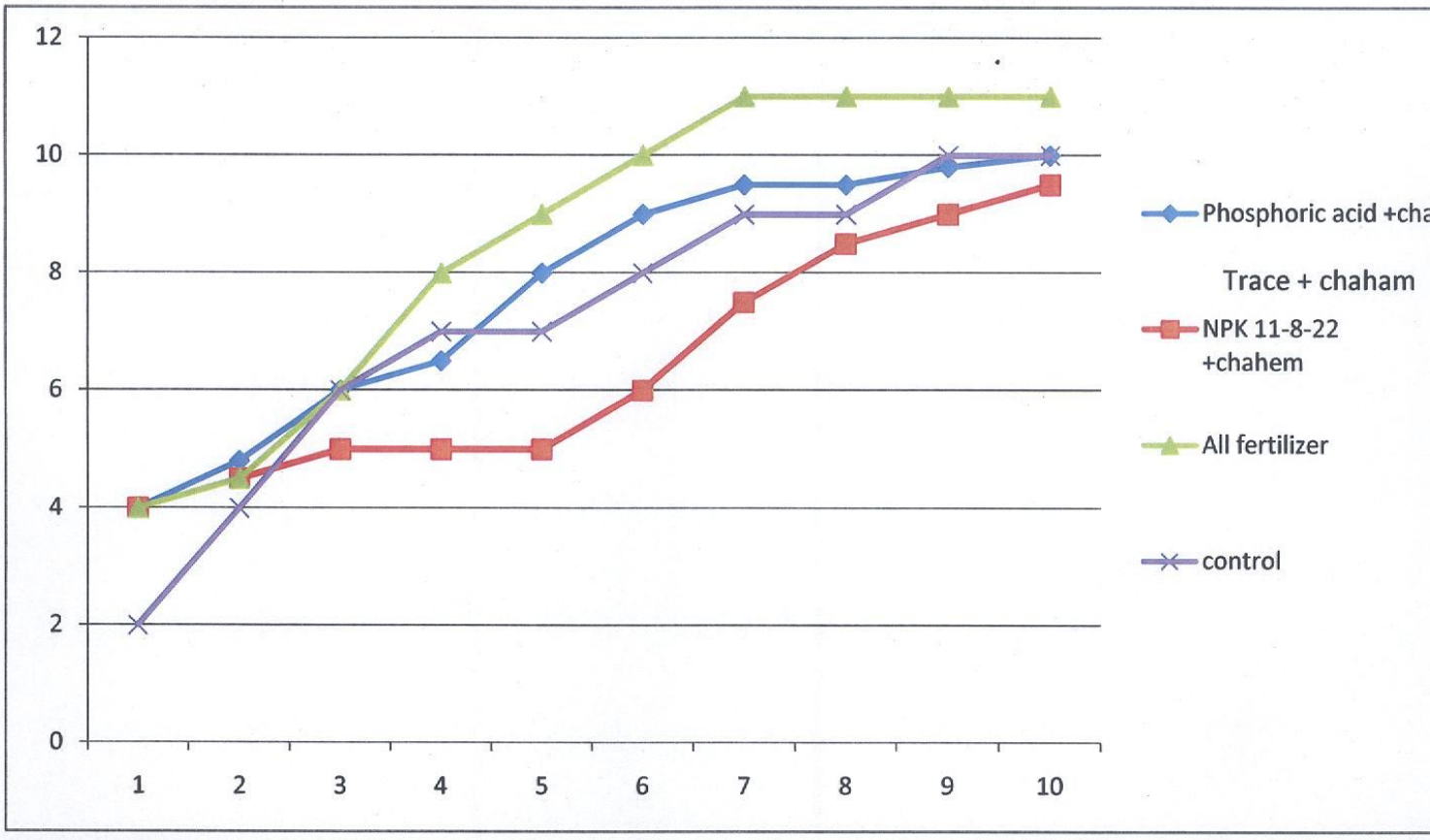
Pepper length in cm

week	trace +chaham (cm)	NPK 11-8-22 +chaham	All fertilizer (cm)	Control (cm)
1	15.5 cm	5.5 cm	29 cm	13.5 cm
2	16 cm	5.8 cm	32 cm	17.8 cm
3	17 cm	6 cm	39.5 cm	21 cm
4	20 cm	9.5 cm	40 cm	29 cm
5	21 cm	20 cm	40 cm	31 cm
6	27 cm	29 cm	40 cm	37 cm
7	37 cm	31 cm	41 cm	39 cm
8	44.5 cm	32 cm	41 cm	40 cm
9	46.5 cm	33.5 cm	42 cm	42 cm
10	48 cm	35 cm	42 cm	43 cm



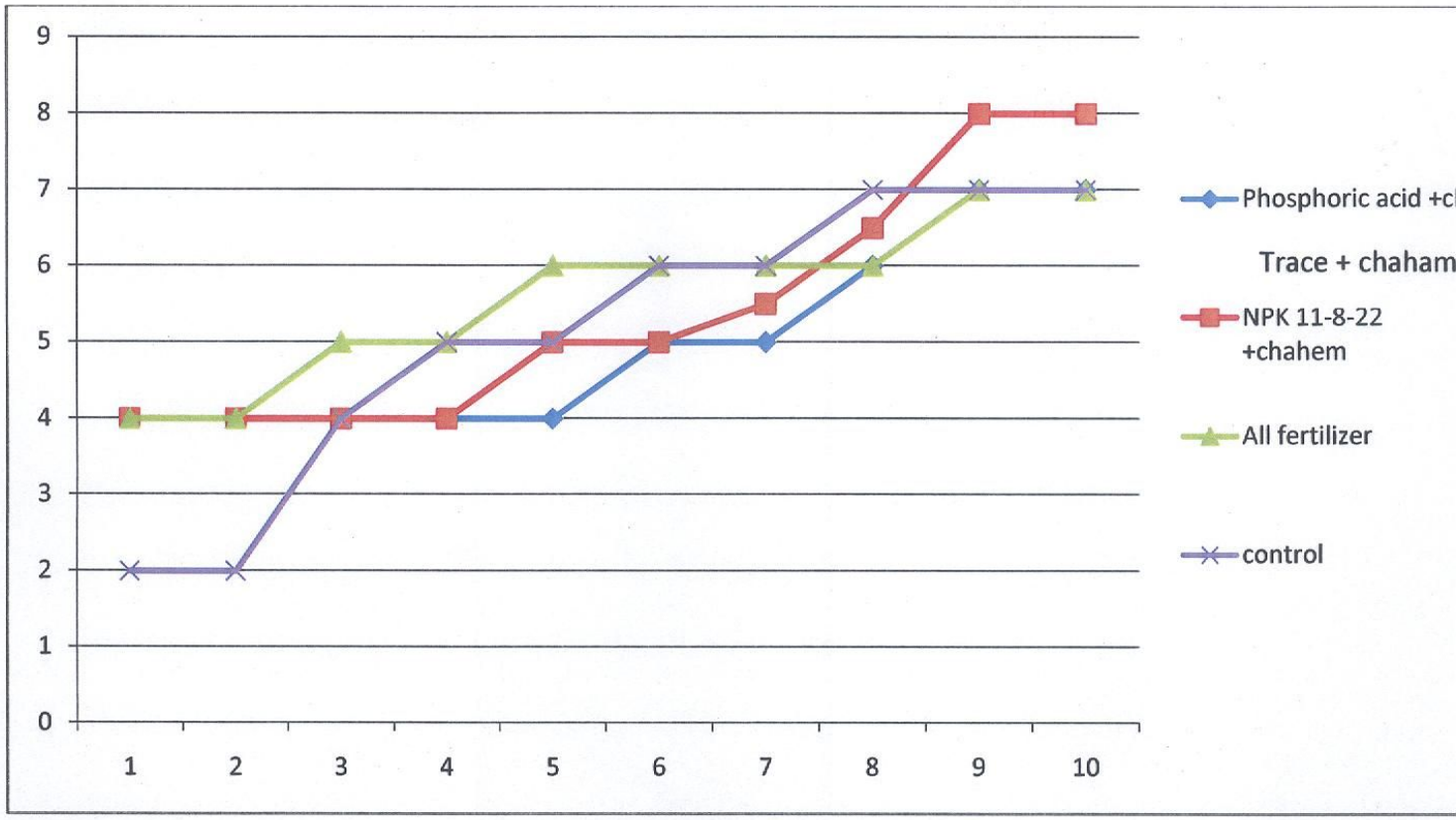
Tomato diameter in mm

week	Trace +chaham (mm)	NPK 11-8-22 +chaham	All fertilizer (mm)	Control (mm)
1	4 mm	4 mm	4 mm	2 mm
2	4.8 mm	4.5 mm	4.5 mm	4 mm
3	6 mm	5 mm	6 mm	6 mm
4	6.5 mm	5 mm	8 mm	7 mm
5	8 mm	5 mm	9 mm	7 mm
6	9 mm	6 mm	10 mm	8 mm
7	9.5 mm	7.5 mm	11 mm	9 mm
8	9.5 mm	8.5 mm	11 mm	9 mm
9	9.8 mm	9 mm	11 mm	10 mm
10	10 mm	9.5 mm	11 mm	10 mm



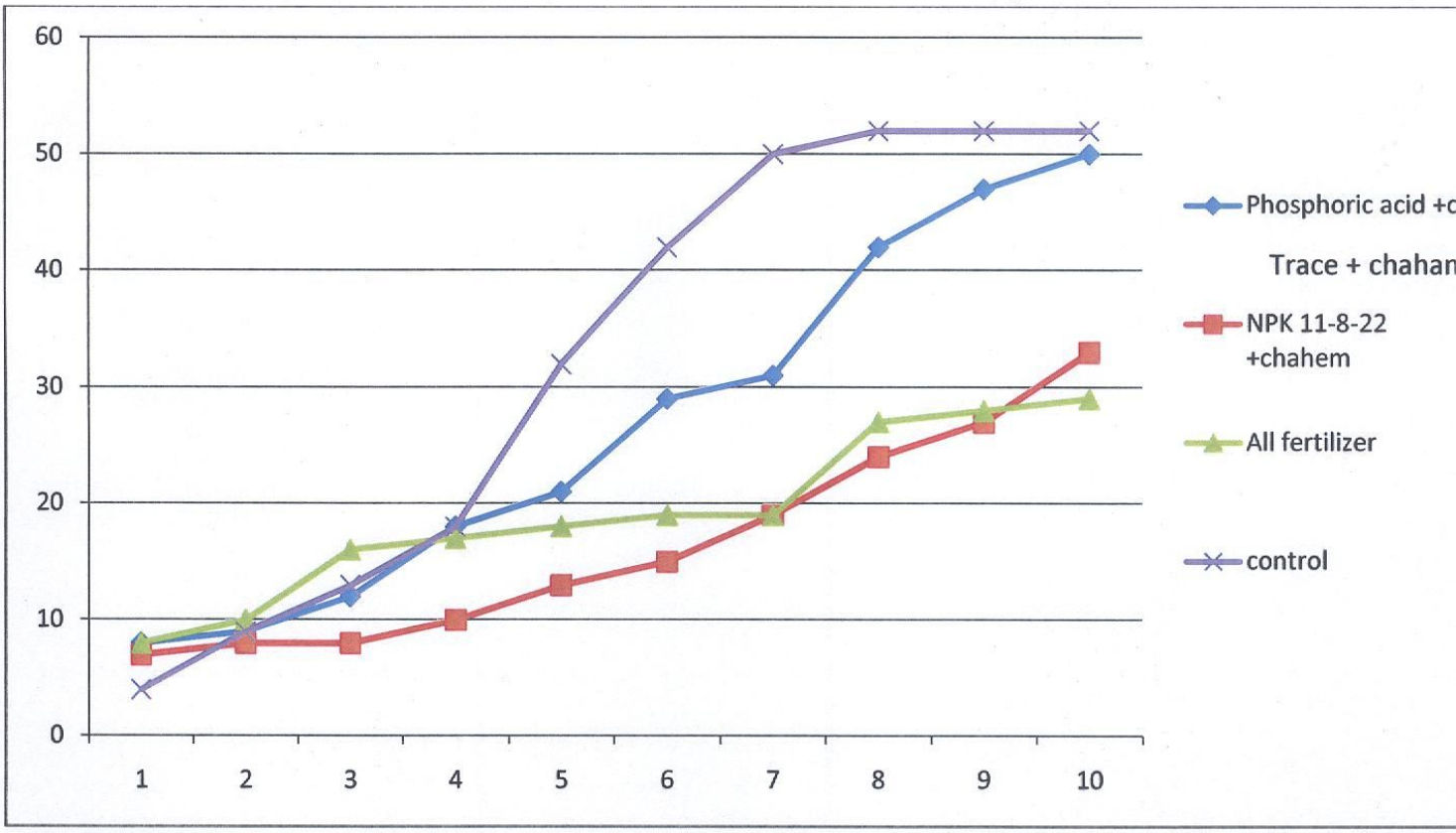
pepper diameter in mm

week	trace +chaham	NPK 11-8-22 +chaham	All fertilizer	control
1	4 mm	4 mm	4 mm	2 mm
2	4 mm	4 mm	4 mm	2 mm
3	4 mm	4 mm	5 mm	4 mm
4	4 mm	4 mm	5 mm	5 mm
5	4 mm	5 mm	6 mm	5 mm
6	5 mm	5 mm	6 mm	6 mm
7	5 mm	5.5 mm	6 mm	6 mm
8	6 mm	6.5 mm	6 mm	7 mm
9	7 mm	8 mm	7 mm	7 mm
10	7 mm	8 mm	7 mm	7 mm



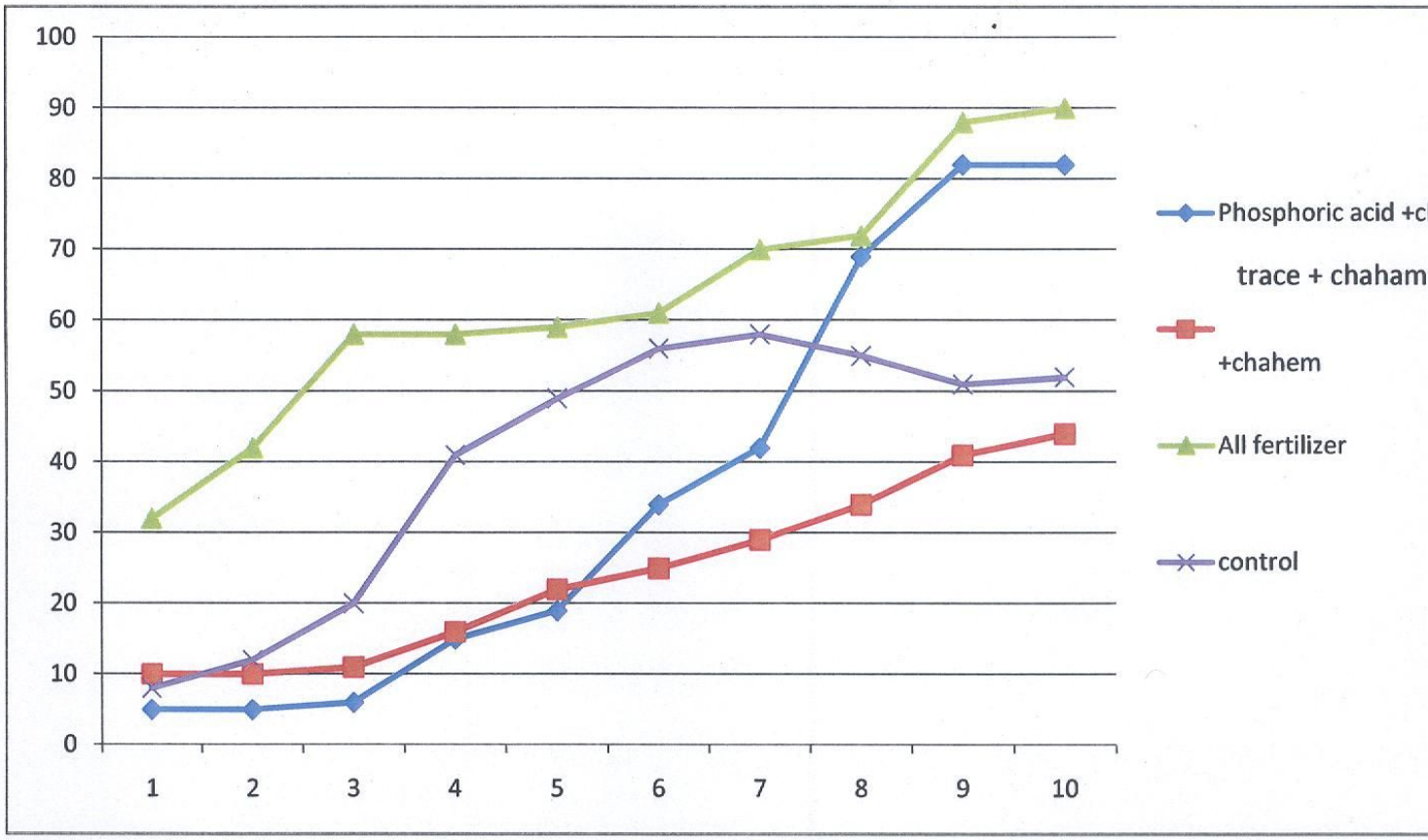
Tomato number of branch on the main stem

week	trace +chahem	NPK 11-8-22 +chahem	All fertilizer	control
1	8	7	8	4
2	9	8	10	9
3	12	8	16	13
4	18	10	17	18
5	21	13	18	32
6	29	15	19	42
7	31	19	19	50
8	42	24	27	52
9	47	27	28	52
10	50	33	29	52



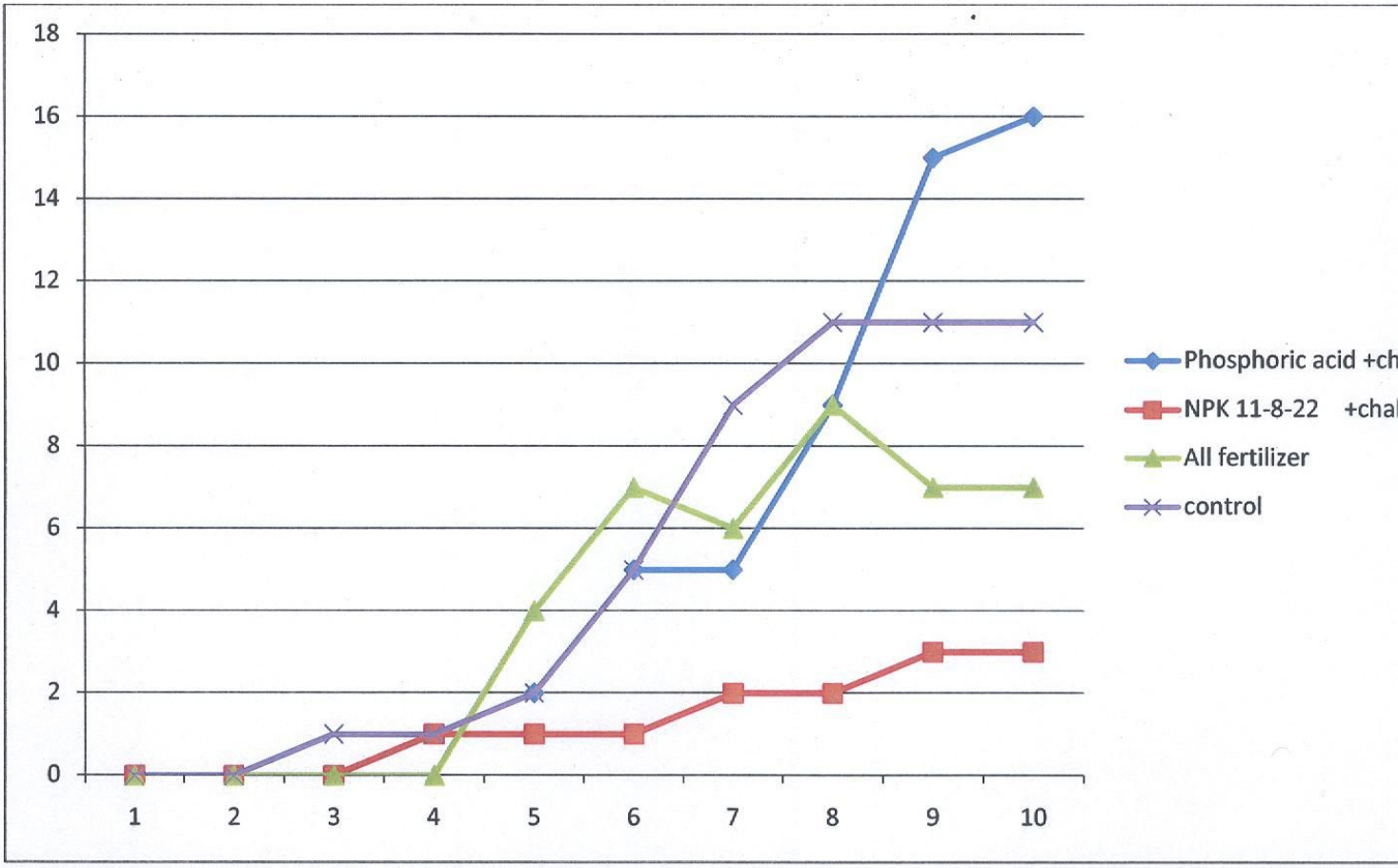
pepper number of leaves

week	trace+chahem	NPK 11-8-22 +chahem	All fertilizer	control
1	5	10	32	8
2	5	10	42	12
3	6	11	58	20
4	15	16	58	41
5	19	22	59	49
6	34	25	61	56
7	42	29	70	58
8	69	34	72	55
9	82	41	88	51
10	82	44	90	52



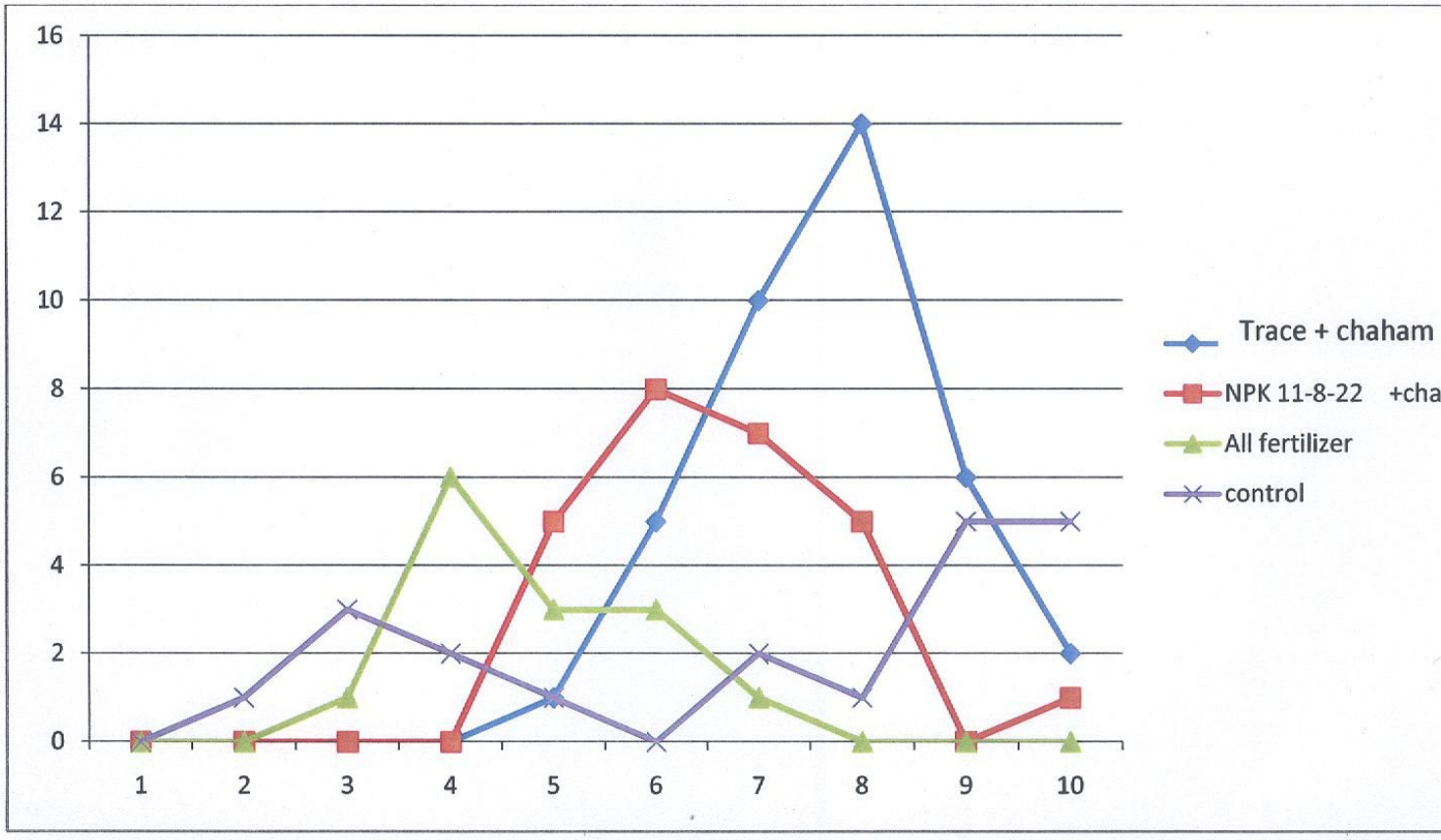
Tomato number of flower cluster

week	Phosphoric acid +chahem	NPK 11-8-22 +chahem	All fertilizer	control
1	0	0	0	0
2	0	0	0	0
3	0	0	0	1
4	1	1	0	1
5	2	1	4	2
6	5	1	7	5
7	5	2	6	9
8	9	2	9	11
9	15	3	7	11
10	16	3	7	11



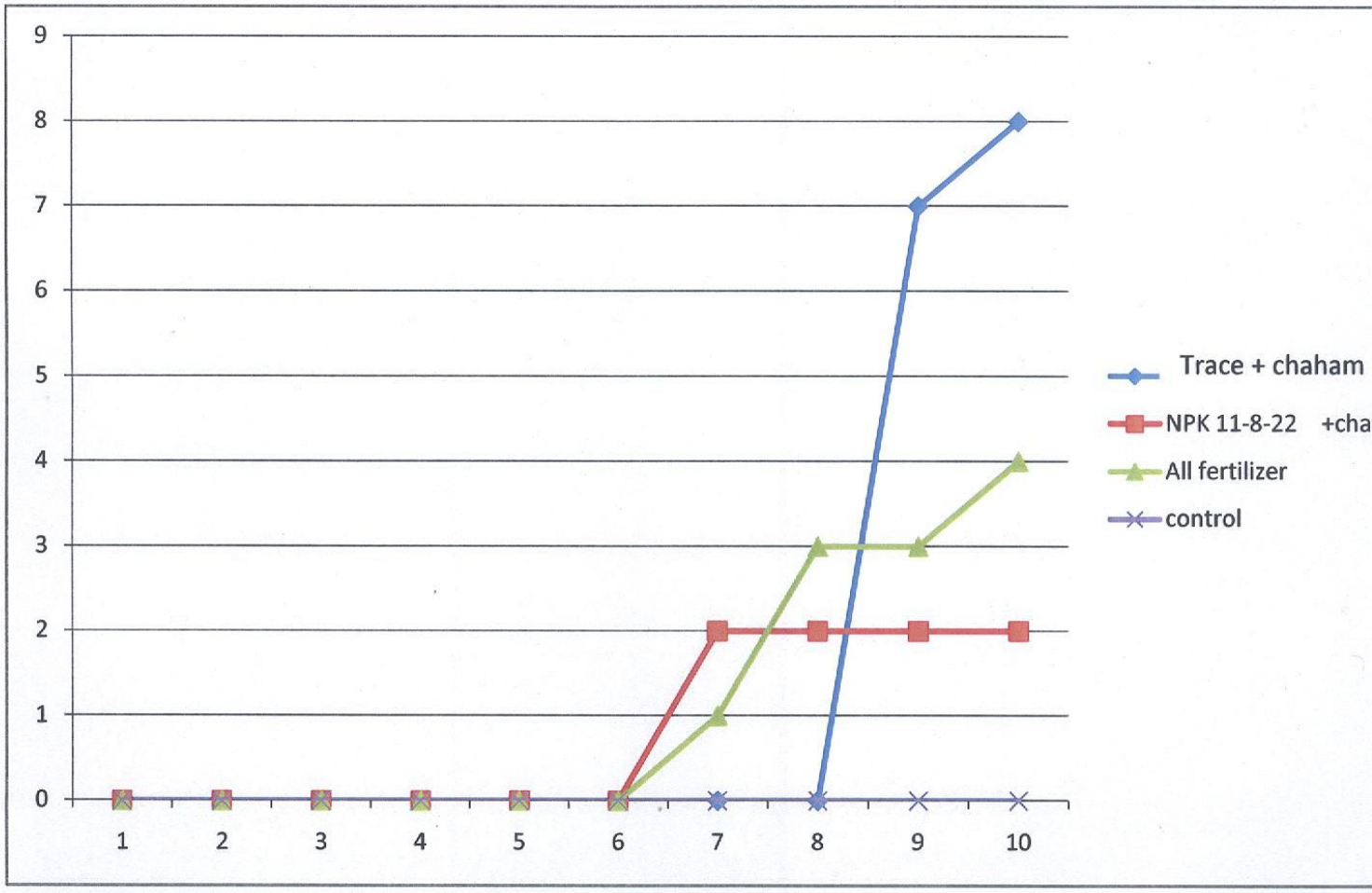
pepper number of flower

week	trace +chaham	NPK 11-8-22 +chahem	All fertilizer	control
1	0	0	0	0
2	0	0	0	1
3	0	0	1	3
4	0	0	6	2
5	1	5	3	1
6	5	8	3	0
7	10	7	1	2
8	14	5	0	1
9	6	0	0	5
10	2	1	0	5



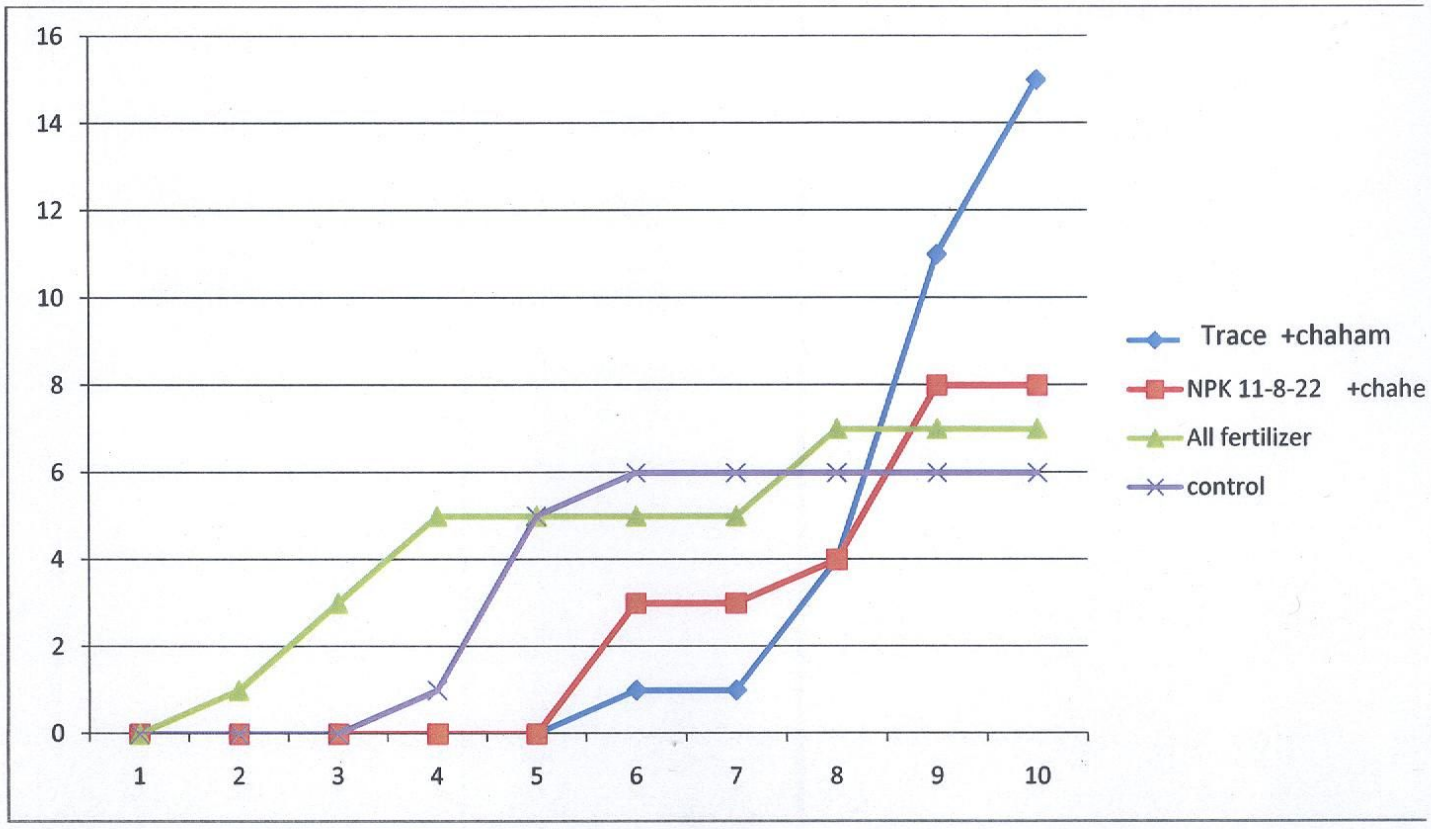
Tomato number of fruit

week	Trace +chahem	NPK 11-8-22 +chahem	All fertilizer	control
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	2	1	0
8	0	2	3	0
9	7	2	3	0
10	8	2	4	0



pepper number of fruit

week	trace +chahem	NPK 11-8-22 +chahem	All fertilizer	control
1	0	0	0	0
2	0	0	1	0
3	0	0	3	0
4	0	0	5	1
5	0	0	5	5
6	1	3	5	6
7	1	3	5	6
8	4	4	7	6
9	11	8	7	6
10	15	8	7	6



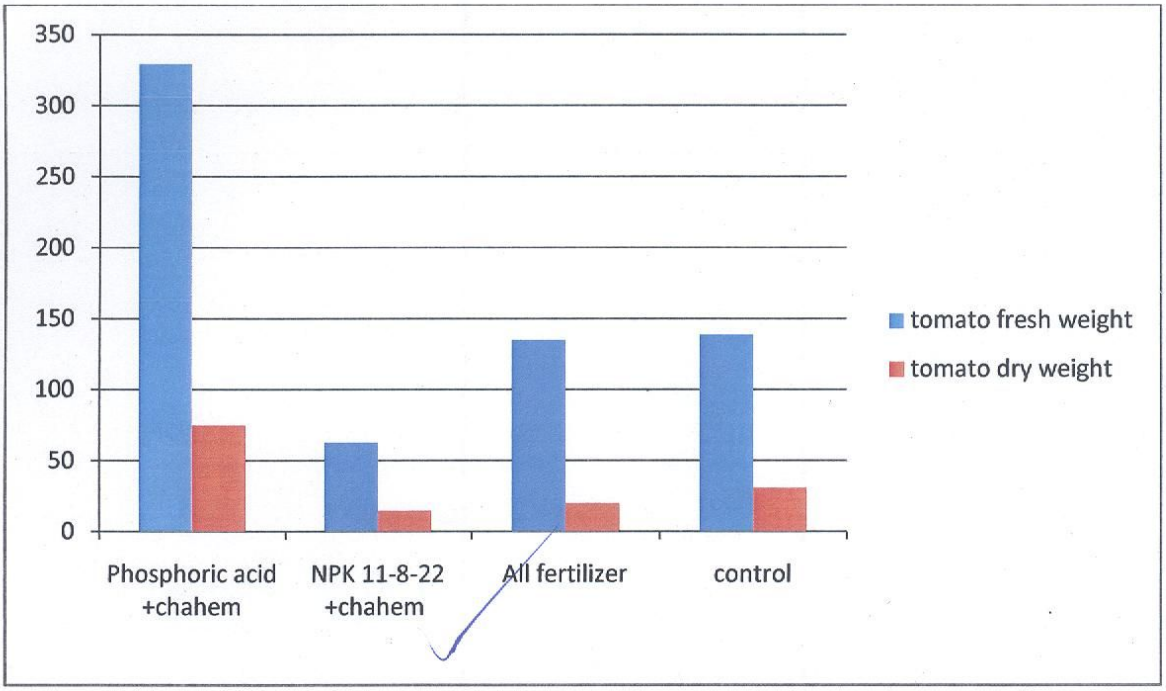
Fresh weight + dry weight + fruit weight

	trace +chahem		NPK 11-8-22 +chahem		All fertilizer		control	
	Tomato	pepper	Tomato	pepper	Tomato	pepper	Tomato	pepper
Fresh weight	330g	43g	63g	39g	135.4g	29.9g	139g	23g
Dry weight	75.2g	11g	15g	10g	20.1g	5.8g	31g	3g
number of fruit and size	8 very small fruit	6 large 9 very small	2 small to medium	8 large	4	7	0	6
Yield (Fruit weight)	12g	182.7	58.2	220.8	202.4	135.2	0	83.4

%Y = yield at 0 level of nutrient / highest yield obtained from nutrient addtion

%Y in pepper = 83.4/ 135.2 = .61%

%Y in tomato = 0 / 202.4 = 0%


350
300
250
200
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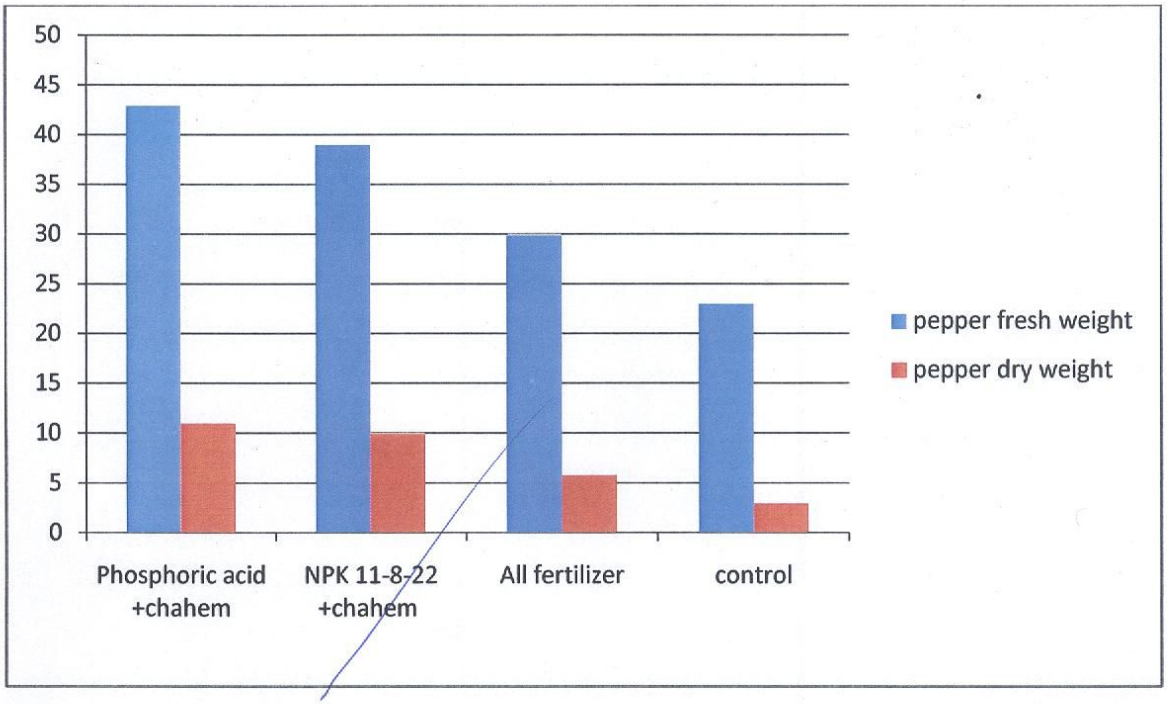
0
Phosphoric acid +chahem
NPK 11-8-22 +chahem
All fertilizer
control
tomato fresh weight
tomato dry weight


50
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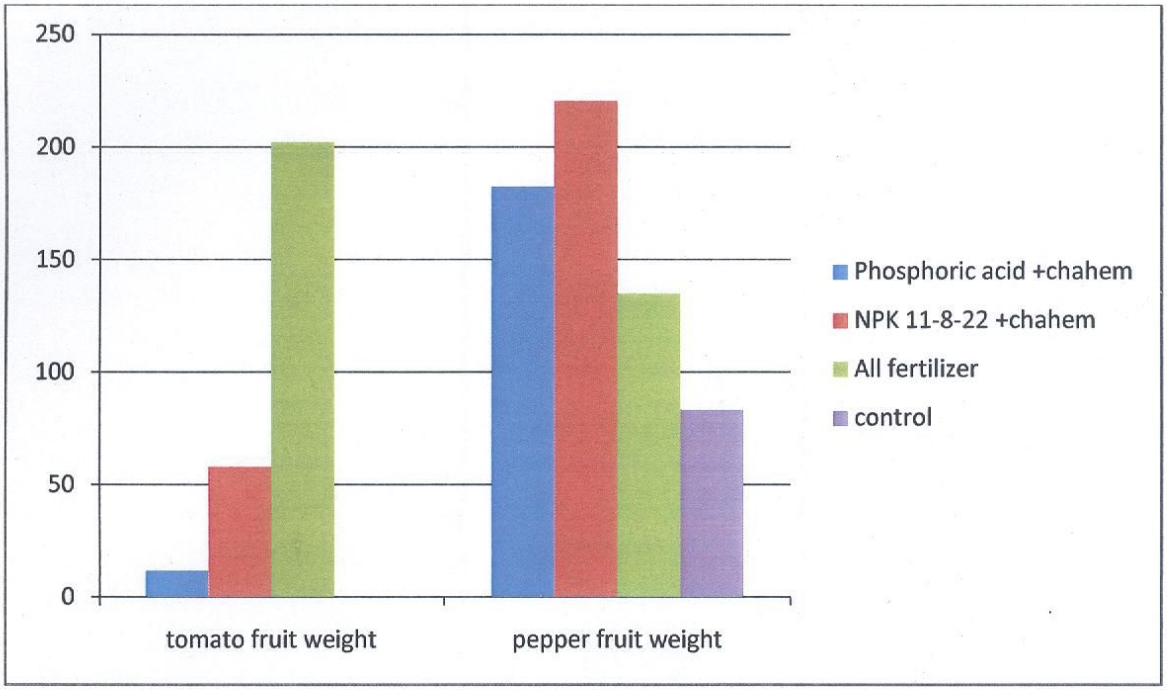
Phosphoric acid +chahem
NPK 11-8-22 +chahem
All fertilizer
control
pepper fresh weight
pepper dry weight


250
200
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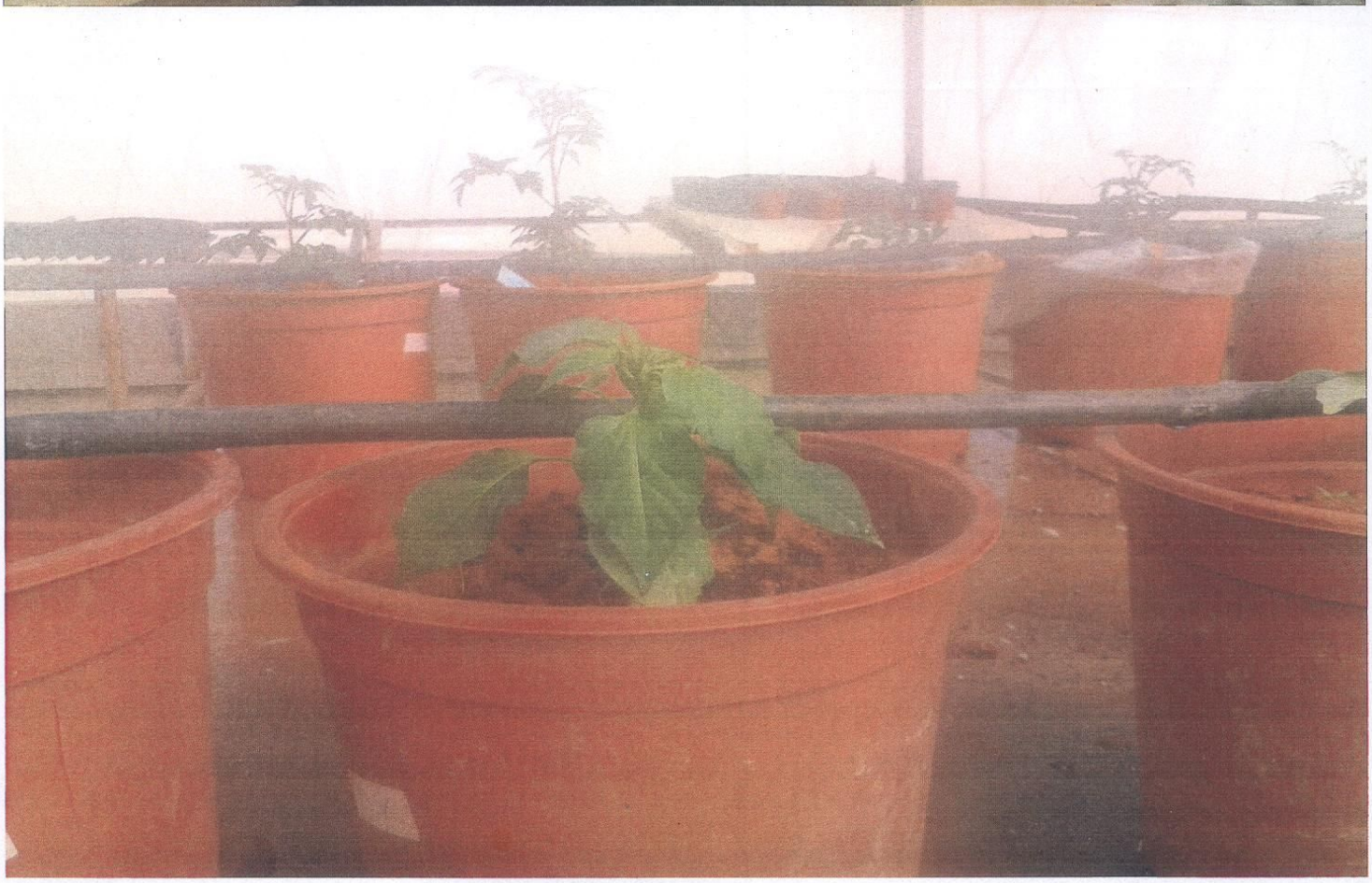
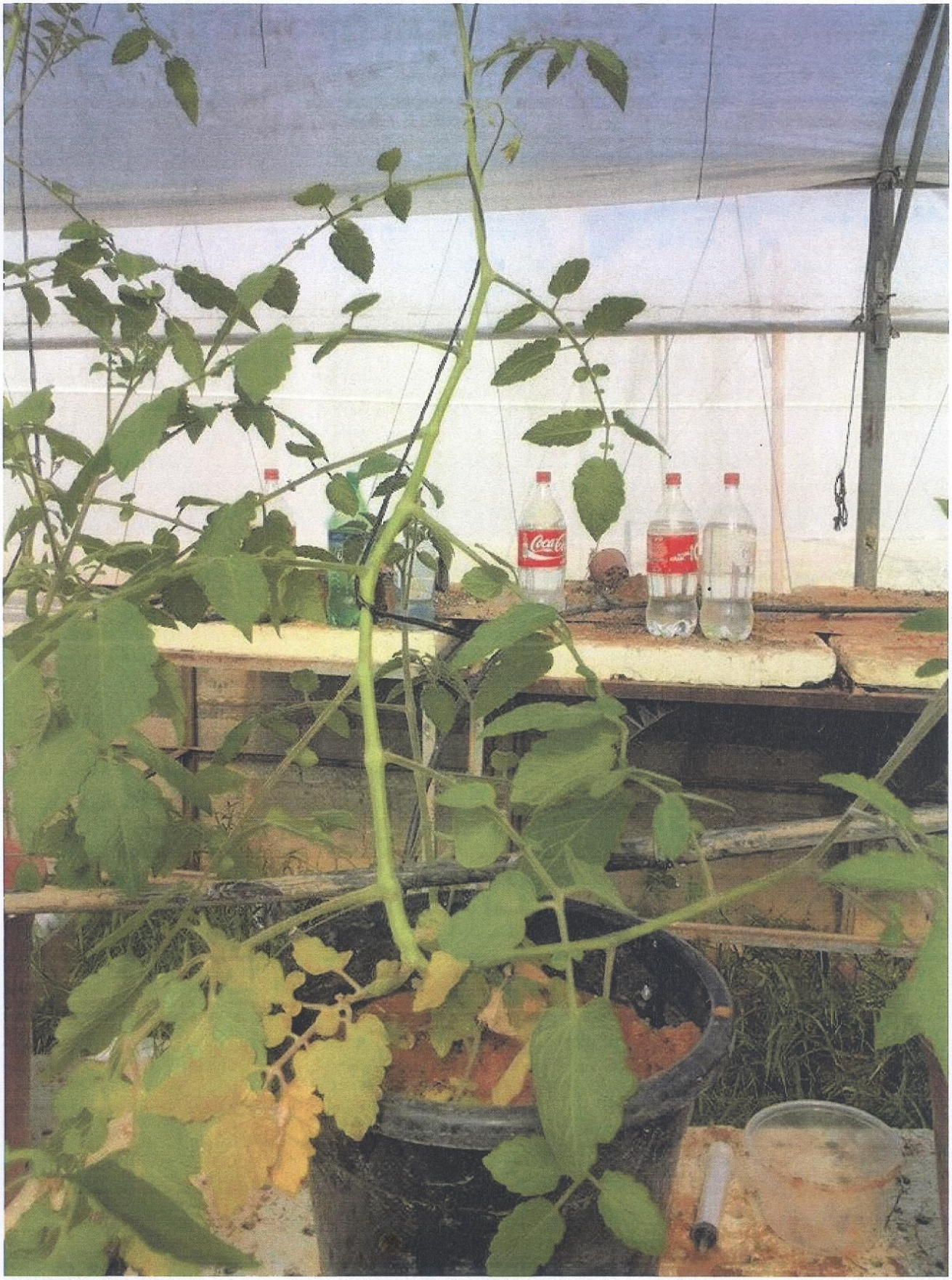
tomato fruit weight
pepper fruit weight
Phosphoric acid +chahem
NPK 11-8-22 +chahem
All fertilizer
control





Conclusion

the effect of trace and chahem on tomato shows increasing in branching on main stem and in the growth of plant especially longitudinal also we observe significantly increase in the flower formation and some what the fruit formation but the fruit development was very slow in tomato since the fruit remain small for long period . on the other hand, the phosphoric acid and chahem on pepper shows increasing in fruit formation and development also we osbserve increase in flower and like tomato the branching from main stem increase and over all phosphoric acid and chahem shows a good effect on plant growth and development , no side effect shown on any plant .

the effect of NPK 11-8-22 and chahem on tomato was very good and can be summarizer by good branching and good flower and fruit formation and a very good fruit development which can be observe clearly on the fruit and the growth and branching was more Regularthan phosphoric acid . on the other hand the effect of NPK on pepper was somewhat similar to tomato and we clearly observe a very good and early fruit development since the fruit was ready to harvested early compared to other peppers plant in the nursery.