Sand Soil Culture

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Introduction

Nitrogen

Nitrogen (N) is taken up by plants as nitrate (NO3-). or ammonium (NH4+)ions. It is utilized by plants to synthesize amino acids, the building blocks of proteins. The protoplasm of all living cells contains protein. Nitrogen is also required by plants for other vital compounds, such as chlorophyll, nucleic acids, and enzymes. Chlorosis is usually more pronounced in older tissue. Since nitrogen is mobile within plants, it tends to move from older to younger tissue when in short supply.

Symptoms of N Deficiency

1. Slow growth; stunted plan
2. Yellow-green color (chlorosis)
3. Death (necrosis) of tips and margins of leaves, beginning with more mature leaves.

PHOSPHORUS

Phosphorus (P) is taken up by plants as ortho-phosphate PO4
Phosphorus present in all living cells. It is utilized by the plant to - Through energy-rich linkages .(form nucleic acids (DNA and RNA (ATP and ADP), it is involved in the storage and transfer of chemical energy used for growth and reproduction. Phosphorus stimulates seedlingdevelopment and root formation. It hastens Phosphorus .maturity and promotes seed production supplementation is required most by plants under the following cold weather, (2) limited root growth period, and (3) :circumstances rapid vegetative growth

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Symptoms of P Deficiency

1.Slow growth; stunted plant
2.Purplish coloration on foliage of some plants (older leaves first)
3.Dark green coloration
4.Delayed maturity
5.Poor fruit or seed development

POTASSIUM

Potassium (K) is taken up by plants in the form of potassium ions (k+)
It remains ionic form within cells and tissues. Potassium is essential for translocation of sugars and for formation of starch. It .is required in the opening and closing of stomata by guard cells Potassium promotes root growth; produces larger, more uniformly distributed xylem vessels throughout the root system; and increases plant resistance to disease. Potassium increases
size and quality of fruits, nuts, and vegetables and improves winter Plants that produce large amounts of .hardiness of perennials carbohydrates have a high potassium requirement

Symptoms of K Deficiency

1.Slow growth
2.Tip and marginal chlorosis
3.Weak stems and stalks
4.Small fruit or shriveled seeds

Trace elemant : Sand Culture

Trace minerals is amounts generally less than 100 milligrams / day as opposed to macrominerals which are required in larger quantities . the microminerals or trace elements include at least iron , cobalt , chromium , copper , iodine , manganese , selenium , zinc and molybdenum . micronutrients also include vitamins , which are organic compounds required as nutrients.

Materal and methods

1.tomato transplants
2.pepper transplants
3.metar
4.caliper
5.(N.P.K)solutions fertilizer
6.trace element solutions fertilizer
7.ourea solutions fertilizer
8.bottles
9.sand soil

Treatment and measurement

- Treatment were replicated 2 times on pepper plants and tomato ,the treatment was conducted by planting these two tomato plants and pepper in pots with sand soil.
- The adding of nutrients solution (we were add potassium and phosphorus and NPK)was done one time every week with distilled water every days .
- Every week the length , diameter , no. of leaves, flowers and fruits were identified and recorded .

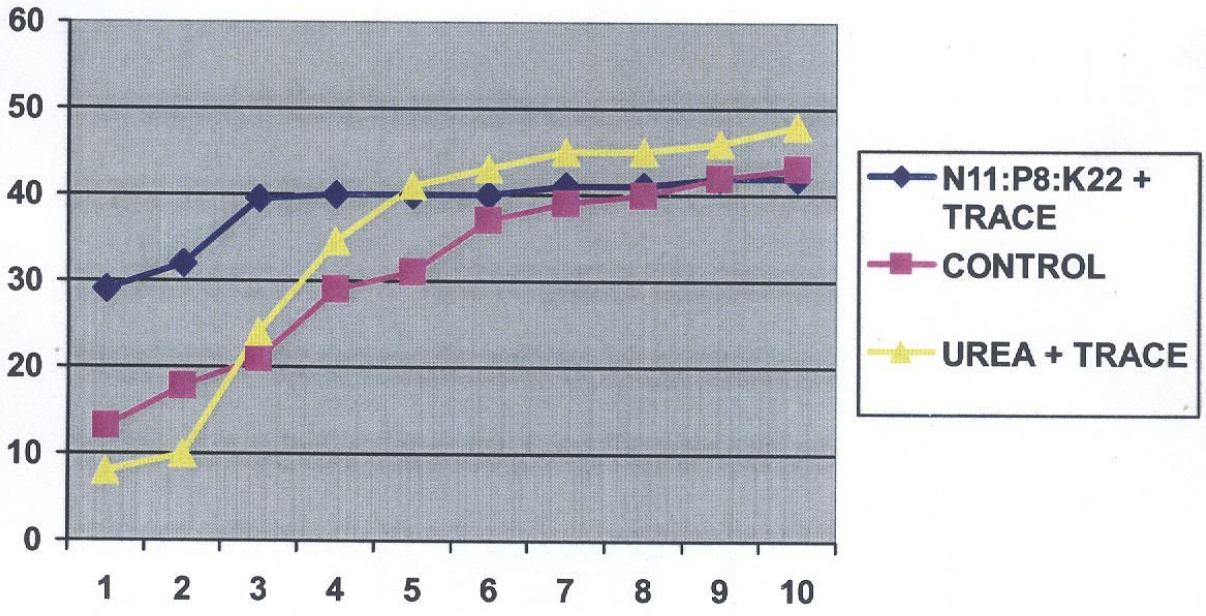
Results

Pepper with N:P:K (11:8:22) &TRACE Fertilizer

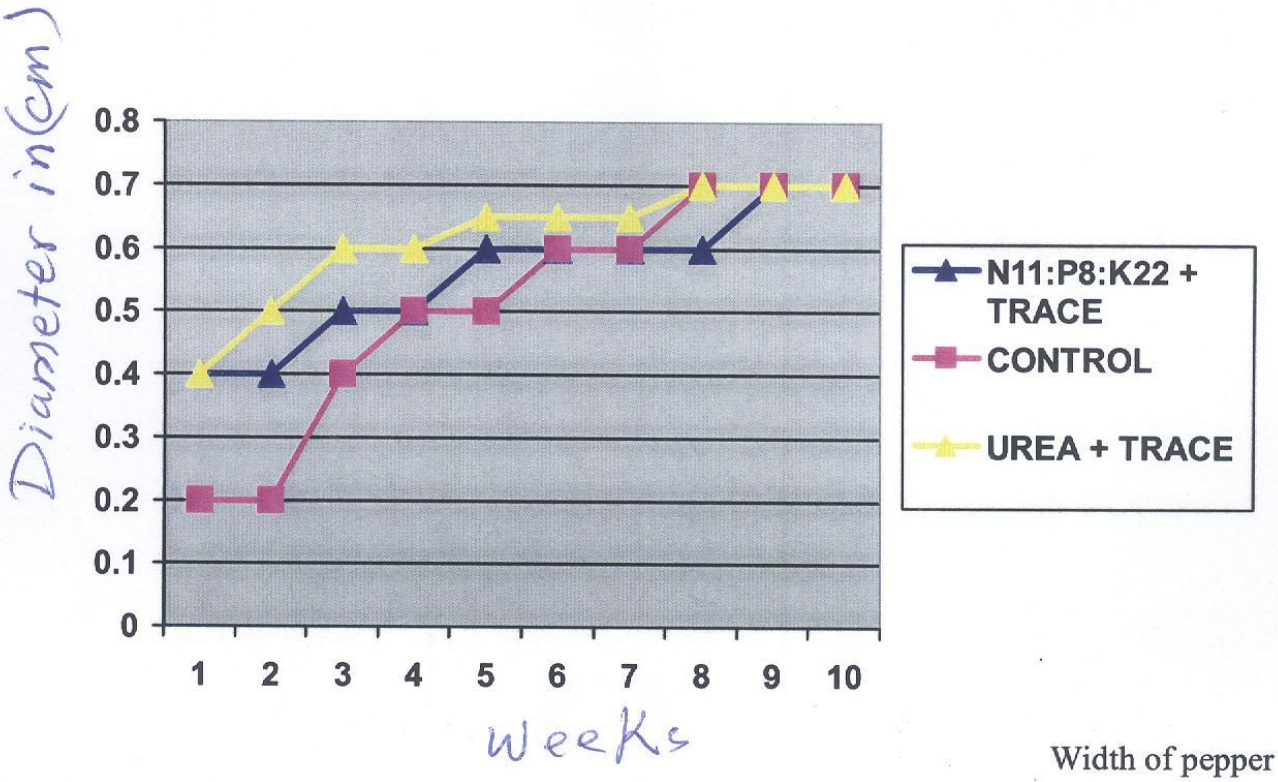
	length	width	no. leaves	no. flower	no. fruit
1	29	0.4	32	1	0
2	32	0.4	42	3	1
3	39.5	0.5	58	2	3
4	40	0.5	58	1	5
5	40	0.6	59	0	5
6	40	0.6	61	0	5
7	41	0.6	70	2	5
8	41	0.6	72	1	7
9	42	0.7	88	5	7
10	42	0.7	90	0	7

Pepper with UREA & TRACE Fertilizer

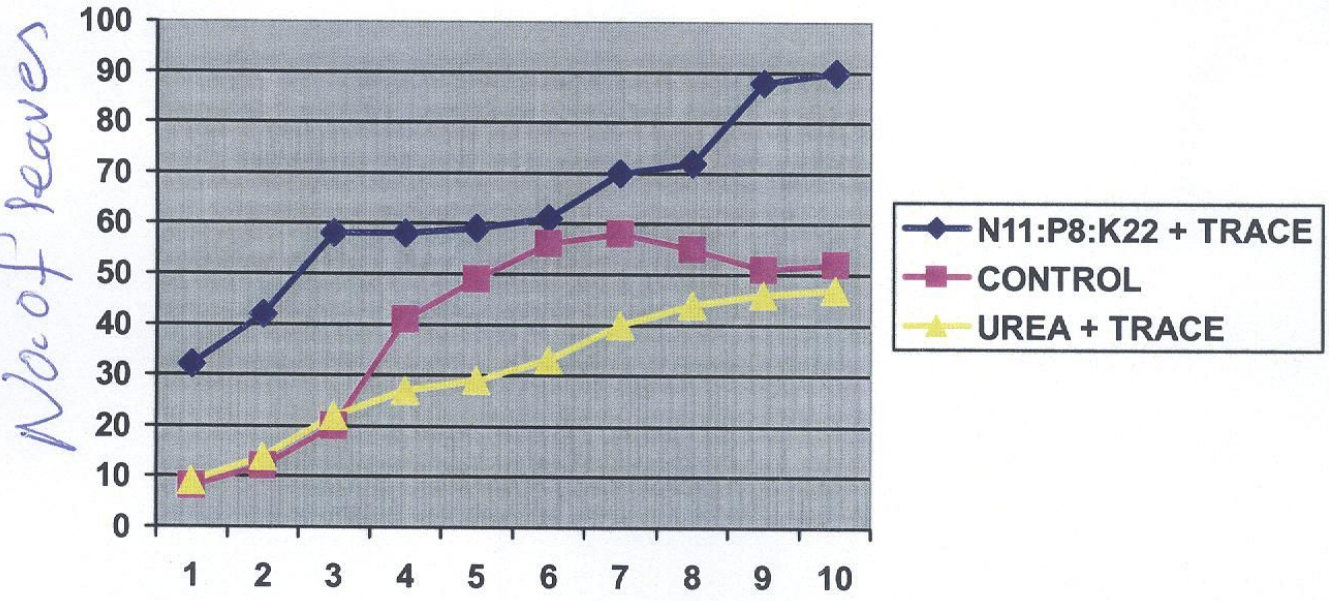
	length	Width	no. leaves	no. flower	no. fruit
1	8	0.4	9	0	0
2	10	0.6	14	0	0
3	24	0.6	22	1	0
4	34	0.65	27	1	1
5	41	0.65	29	0	3
6	43	0.65	32	5	3
7	45	0.7	40	3	3
8	45	0.7	44	1	3
9			46	4	3
10	48	0.7	48	0	3



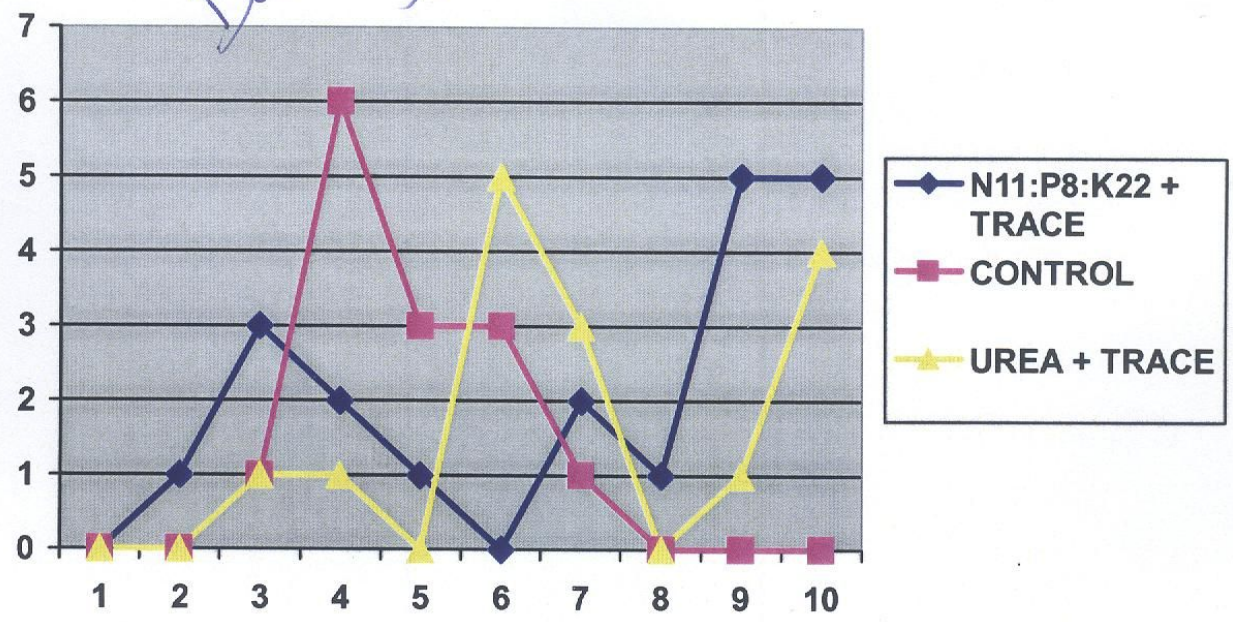
Length of pepper



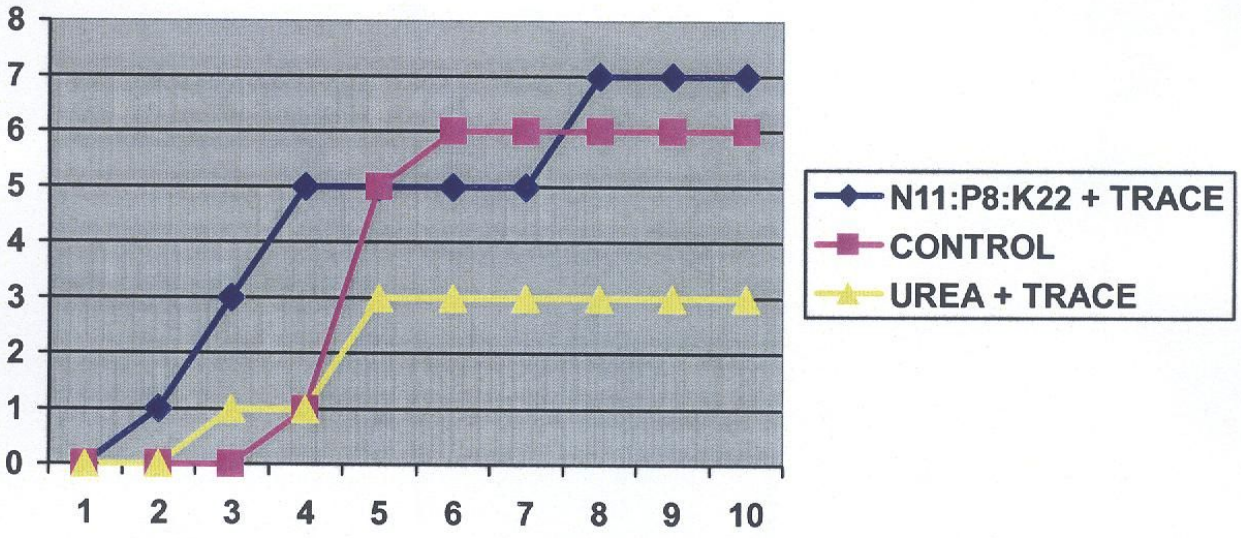
Width of pepper



NO.OF Leaves in pepper



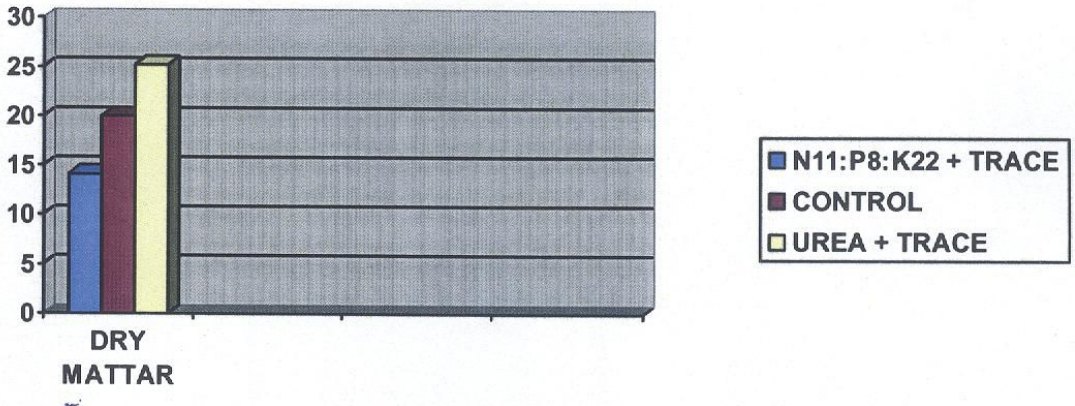
NO.OF Flower in pepper



NO.OF Fruit in pepper

	YEILD (Wt . Fruit)
N11:P8:K22 + TRACE	135.2
CONTROL	83.4
UREA + TRACE	103.9

	Dry mattar (gram)
N11:P8:K22 + TRACE	14.1
CONTROL	20
UREA + TRACE	25.2



%Yield = yield at level of nutrient / yield at obtained from nutrient addition * 100%

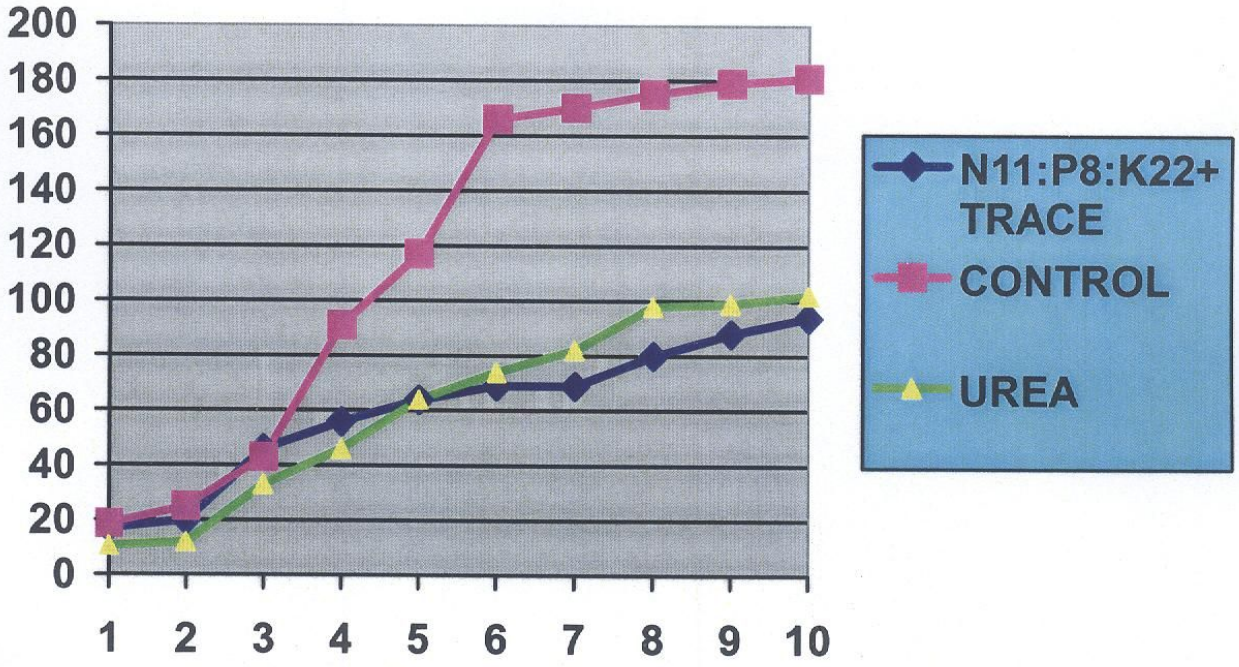
Y= 83.4 / 135.2 = 61.68 %

Tomato with N:P:K (11:8:22) & TRACE Fertilizer

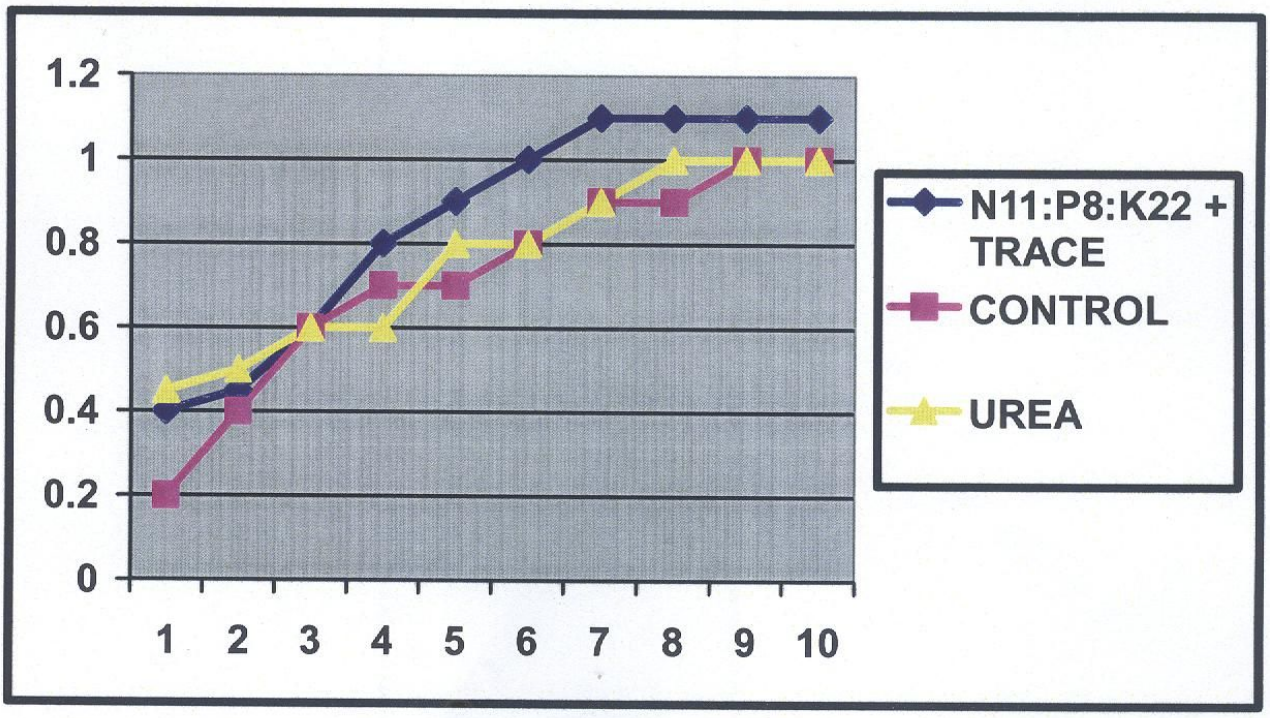
	Length	Width	no. leaves	no. flower	no. fruit
1	17	0.4	8	0	0
2	20	0.45	10	0	0
3	46	0.6	16	0	0
4	56	0.8	17	0	0
5	64	0.9	18	4	0
6	69	1	19	7	0
7	69	1.1	19	6	1
8	80	1.1	27	9	3
9	88	0	28	7	3
10	94	1.1	29	0	4

Tomato with UREA & TRACE Fertilizer

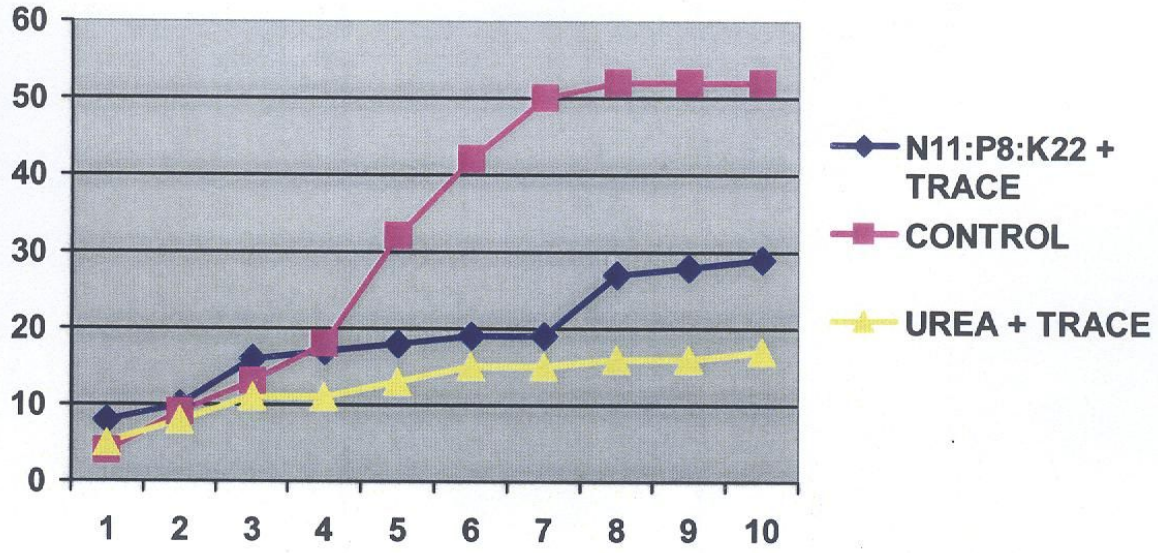
	Length	Width	no. leaves	no. flower	no. fruit
1	10.5	0.45	5	0	0
2	12	0.5	8	0	0
3	33	0.6	11	0	0
4	46	0.6	11	0	0
5	64	0.8	13	3	0
6	82	0.8	15	4	0
7	74	1	15	5	1
8	98	1	16	5	3
9	99	1.1	16	5	3
10	102	1.1	18	5	3



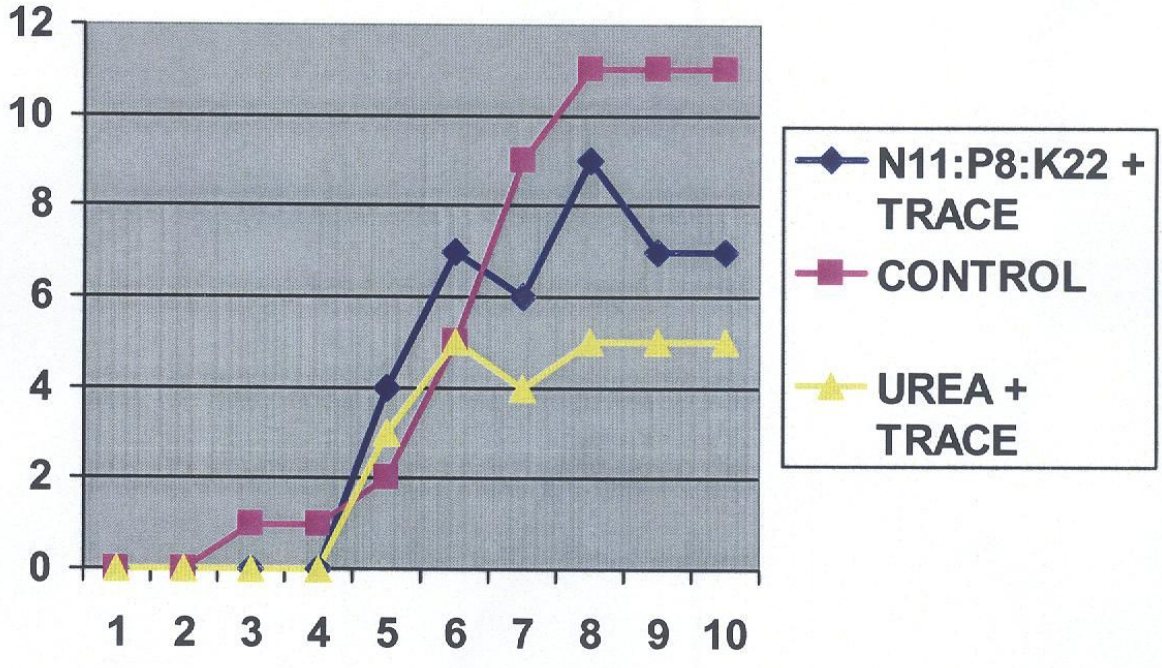
Length of tomato



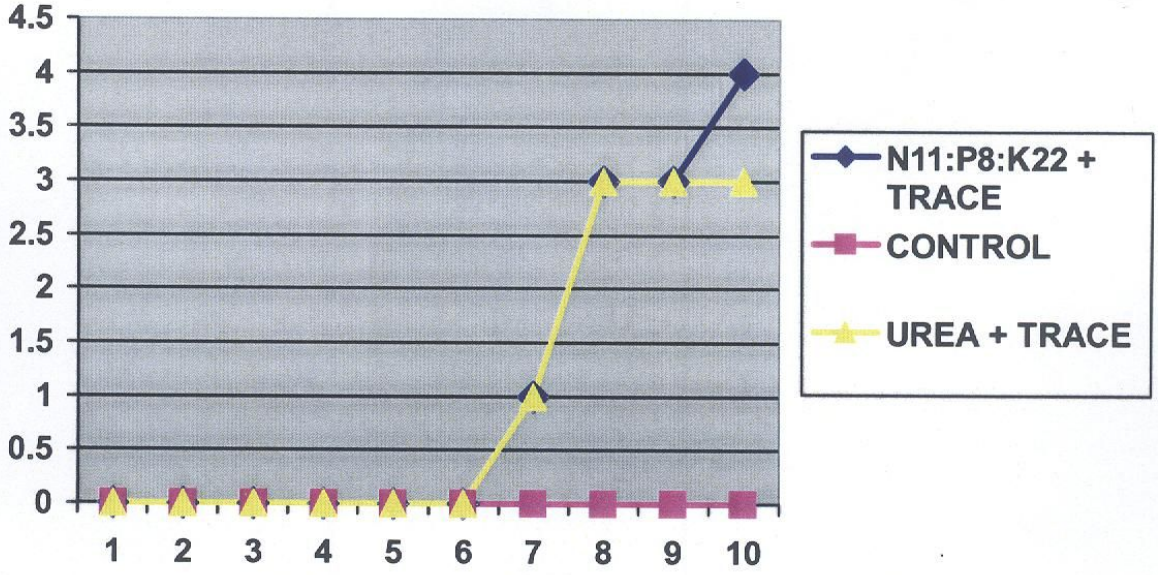
Width of tomato



NO. OF Leaves in tomato

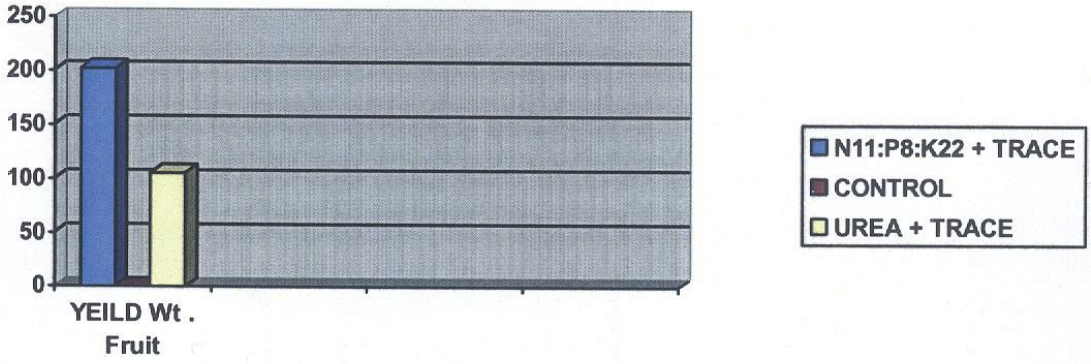


NO.OF Flower in tomato



NO.OF Fruit in tomato

	YEILD (Wt . Fruit)
N11:P8:K22 + TRACE	202.4
CONTROL	0
UREA + TRACE	105.3



Yield of tomato

	Dry mattar (gram)
N11:P8:K22 + TRACE	115.3
CONTROL	108
UREA + TRACE	60.7

Dry matter of tomato

%Yield = yield at level of nutrient / yield at obtained from nutrient addition * 100%

Y= 0 / 202.4 = 0

Conclusion

We show that the plant with all fert + trace have more yield and more vegetative growth than other plant so the nutrients play an important role in plant nutrition and we show that the plant with all fert don't show any deficiency but the other plant show symptoms.