Evaluation of Non-Conventional Fertilizers on the Growth Response of Zinnia Seedlings

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ABSTRACT: *Plants are the precious gift given by nature to mankind. The commercial important of flowers has been realized throughout the world and today floriculture has developed into an intensive form of agriculture. Flowers and gardens have for long been important in India , for three main considerations namely aesthetic , Economic and Social. Zinnia has many types depending mainly on the shape and size of flower , plant height and cultivars in each type varying in flower colour. India is endowed with natural wealth of plant materials, which are of great horticultural and floricultural importantand significance. Maintaining adequate quantities of nutrients in soil or growing media is important .Nitrogen , Phosphorous and Potash are required in relatively large amount while most other nutrients are needed in only in small amounts.*

Keywords *:Commercial , intense , shape , consideration , natural , materials , nutrient , economic , horticultural .*

1.Introduction :

Developed countries account for more than 90 per cent of the total world trade in floricultural products.

Various minerals and fertilizers have a profound influence on the yield and quality through their effect on production. The increasing demand for cut flowers like zinnia, rose, anthurium, gladiolus, orchids etc., force the floriculture in India to import large quantities of flowers and seeds.

The present investigation facilitate the usage of several items, which are a waste in normal course but turned into value by using it in a proper and at proper condition.

The present investigations carried out by a small attempt in understanding the influence of certain well established plant growth regulators and bio fertilizers on growth and development.

2.EXPERIMENTAL

2.1.Effect of soil administration of different concentrations of sheep's urine and it's combination with fermented gingelly cake and groundnut cake. Azospirillum and Phosphobacterium on the growth of zinnia seedlings.

15 days old zinnia seedlings were transplanted to polythene bags (9x12") containing the mixture of sand and well decomposed cowdung (1). They were divided into one control (A) and three experimental groups (B), (C) and (D).

The experimental groups received soil administration of different concentration of sheep's urine (100%, 50%, 25%) and combination of 50ml 25% sheep's urine +50ml 5% gingelly cake and groundnut cake, 50ml 1% Azospirillum +50ml 25% sheep's urine and 50ml 1% Phosphobacterium + 50ml 25% sheep's urine Once in a week for continuous three weeks. Control (A) seedlings received water treatment only. The growth parameters were recorded after five weeks from the date of transplantation.

2.2.Effect of soil administration of different concentrations of sheep's blood and its combination with fermented gingelly cake and ground nut cake, Azospirillum and Phosphobacterium on the growth of zinnia seedlings.

15 days old zinnia seedlings were transplanted to polythene bags (9x12") containing the mixture of sand and well decomposed cowdung (1:1). They were divided into one control (A) and three experimental groups (B), (C) and (D).

The experimental groups received soil administration of different concentration of sheep's blood (100%, 50%, 25%) and combination of 50ml 25% sheep's blood + 50ml 5% gingelly cake and groundnut cake, 50ml 1% Azospirillum +50ml 25% sheep's blood and 50ml 1% Phosphobacterium +50ml 25% sheep's blood Once in a week for continuous three weeks. Control (A) seedlings received water treatment only. The growth parameters were recorded after five weeks from the date of transplantation.

2.3.Effect of soil administration of different concentrations of sheep's urine and it's combination with fermented gingelly cake and groundnut cake. Azospirillum and Phosphobacterium on the growth of zinnia seedlings.

15 days old zinnia seedlings were transplanted to polythene bags (9x12") containing the mixture of sand and well decomposed cowdung (1). They were divided into one control (A) and three experimental groups (B), (C) and (D).

The experimental groups received soil administration of different concentration of sheep's urine (100%, 50%, 25%) and combination of 50ml 25% sheep's

urine +50ml 5% gingelly cake and groundnut cake, 50ml 1% Azospirillum +50ml 25% sheep's urine and 50ml 1% Phosphobacterium + 50ml 25% sheep's urine Once in a week for continuous three weeks. Control (A) seedlings received water treatment only. The growth parameters were recorded after five weeks from the date of transplantation.

Effect of soil administration of different concentrations of sheep's blood and its combination with fermented gingelly cake and ground nut cake, Azospirillum and Phosphobacterium on the growth of zinnia seedlings.

15 days old zinnia seedlings were transplanted to polythene bags (9x12") containing the mixture of sand and well decomposed cowdung (1:1). They were divided into one control (A) and three experimental groups (B), (C) and (D).

The experimental groups received soil administration of different concentration of sheep's blood (100%, 50%, 25%) and combination of 50ml 25% sheep's blood + 50ml 5% gingelly cake and groundnut cake, 50ml 1% Azospirillum +50ml 25% sheep's blood and 50ml 1% Phosphobacterium +50ml 25% sheep's blood Once in a week for continuous three weeks. Control (A) seedlings received water treatment only. The growth parameters were recorded after five weeks from the date of transplantation.

Plate-1 and Table-1

TABLE – 1

The influence of soil administration of 100ml each of 100% cow's urine, 50% cow's urine, 25% cow's urine on the growth attributes of Zinnia seedlings. Values are the average of two individual experiments in duplicate.

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
Control (A)	25	-	12	6	3
100ml 100% Cow's urine (B)	24	-	10	5.8	2.8
100ml 50% Cow's urine (C)	28.5 (14%)	2	36 (200%)	7.8 (30%)	3.9 (23%)
100ml 25% Cow's urine (D)	30 (20%)	3	48 (300%)	8.9 (48.3%)	4.1 (28.2%)

A-Control seedlings received water treatment only.

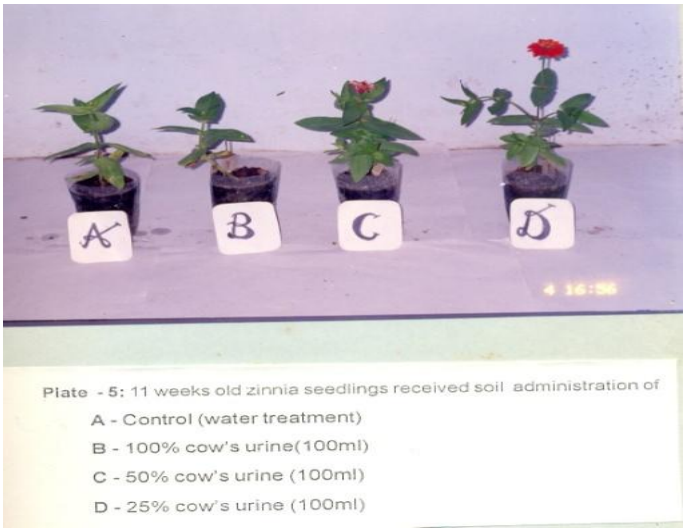

Plate - 5: 11 weeks old zinnia seedlings received soil administration of
A - Control (water treatment)
B - 100% cow's urine(100ml)
C - 50% cow's urine (100ml)
D - 25% cow's urine (100ml)

Table - 2

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
Control (A)	25	-	12	6	3
100ml 25% Cow's urine (B)	38 (52%)	3	28 (133%)	7 (16.6)	3.9 (30%)
50ml 25% Cow's urine+50ml 1% Azospirillum (C)	40 (60%)	3	42 (250%)	8.1 (35%)	4.1 (36.6%)
50ml 25% Cow's urine+50ml 1% Phosphobacterium (D)	45 (80%)	2	36 (200%)	9.8 (63.3%)	4.8 (60%)

Plate-7 and Table-3

The influence of soil administration of 100ml of 25% cow's urine individually and in combination with 50ml 25% cow's urine + 50ml 1% Azospirillum and 50ml 25% cow's urine + 50ml 1% Phosphobacterium on the growth parameters of Zinnia seedlings.

Values are the average of two individual experiments in duplicate

A- Control seedlings received water treatment only.

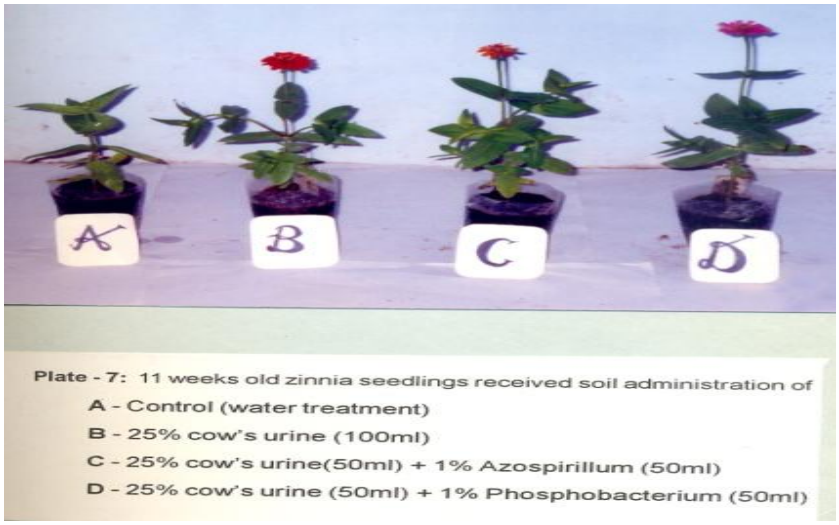

Plate - 7: 11 weeks old zinnia seedlings received soil administration of
A - Control (water treatment)
B - 25% cow's urine (100ml)
C - 25% cow's urine(50ml) + 1% Azospirillum (50ml)
D - 25% cow's urine (50ml) + 1% Phosphobacterium (50ml)

Plate-8 and Table-4

The influence of soil administration of 100ml of 25% sheep's urine and in combination with 50ml 25% sheep's urine + 50ml 5% fermented groundnut cake solution and 50ml 25%

sheep's urine+50ml 5% fermented gingelly cake solution on the growth parameters of Zinnia seedlings.

Values are the average of two individual experiments in duplicate.

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
Control (A)	25	-	12	6	3
100ml 25% Sheep's urine (B)	38 (52%)	3	28 (133%)	7 (16.6)	3.9 (30%)
50ml 25% Sheep's urine+50ml 5% fermented groundnut cake solution (C)	40 (60%)	3	42 (250%)	8.1 (35%)	4.1 (36.6%)
50ml 25% Sheep's urine+50ml 5% fermented groundnut cake solution (D)	45 (80%)	2	36 (200%)	9.8 (63.3%)	4.8 (60%)

A- Control seedlings received water treatment only.

Plate - 8: 11 weeks old zinnia seedlings received soil administration of
A - Control (water treatment)
B - 25% sheep's urine (100ml)
C - 25% sheep's urine(50ml) + 5% fermented groundnut cake (50ml)
D - 25% sheep's urine (50ml) + 5% femented gingelly cake (50ml)

Plate-9 and Table-5

The influence of soil administration of 100ml of 25% sheep's urine individually and in combination with 50ml 25% sheep's urine + 50ml 1% Azospirillum and 50ml 25% sheep's urine+50ml 1% Phosphobacterium on the growth parameters of Zinnia seedlings.

Values are the average of two individual experiments in duplicate.

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
Control A)	25	-	12	6	3
100ml 25% Sheep's urine (B)	39 (56%)	3	35 (191.6%)	10.1 (68.3%)	4.5 (50%)
50ml 25% Sheep's urine+50ml 1% Azospirillum (C)	40 (60%)	3	42 (250%)	8.1 (35%)	4.1 (36.6%)
50ml 25% Sheep's urine+50ml 1% Phospho bacterium (D)	45 (80%)	2	36 (200%)	9.8 (63.3%)	4.8 (60%)

A- Control seedlings received water treatment only.

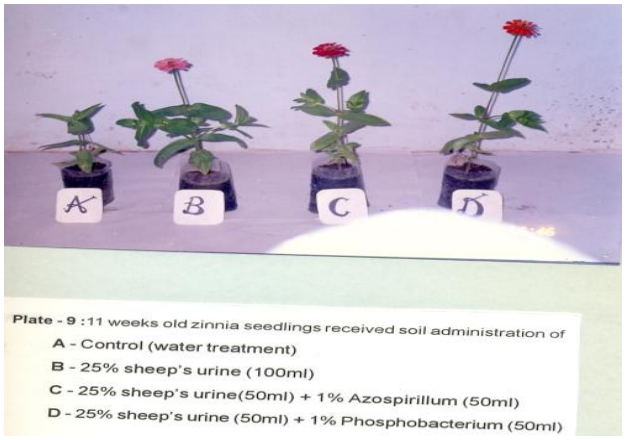

Plate - 9 :11 weeks old zinnia seedlings received soil administration of
A - Control (water treatment)
B - 25% sheep's urine (100ml)
C - 25% sheep's urine(50ml) + 1% Azospirillum (50ml)
D - 25% sheep's urine (50ml) + 1% Phosphobacterium (50ml)

Plate-10 and Table-6

The influence of soil administration of 100ml each of sheep's blood in different dilutions on the growth attributes of Zinnia seedlings.

Values are the average of two individual experiments in duplicate.

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
Control A)	25	-	12	6	3
100ml 100% Sheep's blood solution (B)	27 (8%)	2	26 (116.6%)	8 (33.3%)	4.1 (36.6%)

100ml 50% Sheep's blood solution (C)	**32 (28%)**	**6**	**40 (233%)**	**9 (50%)**	**4.4 (46.6%)**
100ml 25% Sheep's blood solution (D)	**44 (76%)**	**3**	**30 (150%)**	**11 (83.3%)**	**5.7 (90%)**

A- Control seedlings received water treatment only.

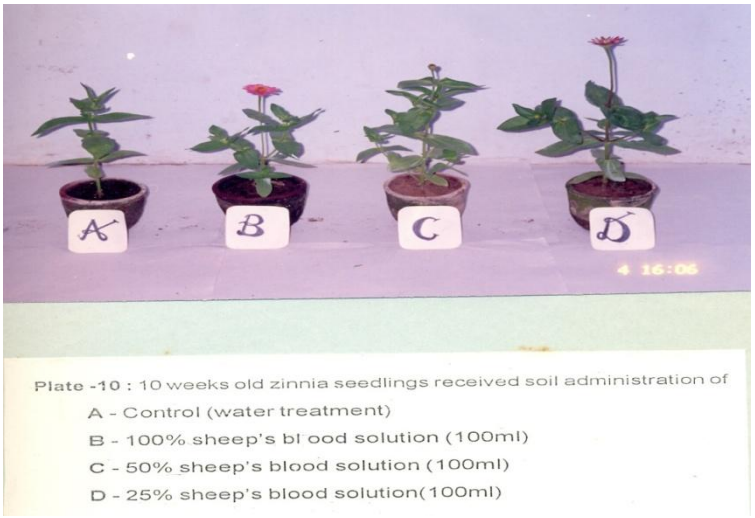

Plate -10 : 10 weeks old zinnia seedlings received soil administration of
A - Control (water treatment)
B - 100% sheep's bl ood solution (100ml)
C - 50% sheep's blood solution (100ml)
D - 25% sheep's blood solution(100ml)

Plate-11 and Table- 7
TABLE – 11

The influence of soil administration of 100ml of 25% sheep's blood and in combination with 50ml 25% sheep's blood+50ml 5% fermented groundnut cake solution and 50ml 25% sheep's blood +50ml 5% fermented gingelly cake solution on the growth parameters of Zinnia seedlings.

Values are the average of two individual experiments in duplicate

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
Control A)	**25**	**-**	**12**	**6**	**3**
100ml 25% Sheep's blood (B)	**44 (36%)**	**3**	**30 (150 %)**	**11 (83.3%)**	**5.7 (90%)**

100ml 25% Sheep's blood + 50ml 5% groundnut cake solution (C)	**37 (48%)**	**2**	**28 (133.3%)**	**9.1 (51.6%)**	**4.3 (43.3%)**
50ml 25% Sheep's blood +50ml 5% gingelly cake solution (D)	**39 (56%)**	**2**	**29 (141.6%)**	**10.2 (70%)**	**4.9 (63.3%)**

A- Control seedlings received water treatment only.

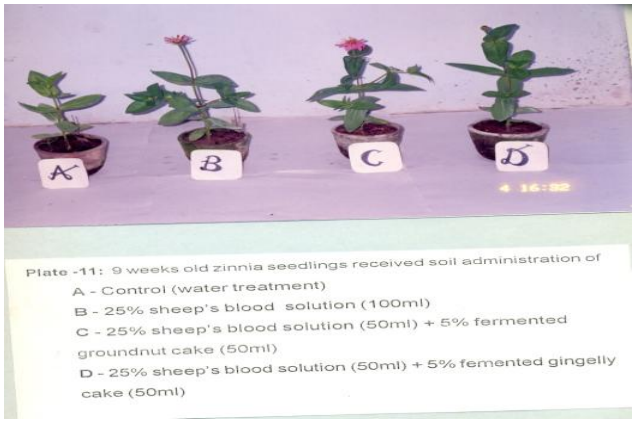

Plate -11: 9 weeks old zinnia seedlings received soil administration of
A - Control (water treatment)
B - 25% sheep's blood solution (100ml)
C - 25% sheep's blood solution (50ml) + 5% fermented groundnut cake (50ml)
D - 25% sheep's blood solution (50ml) + 5% femented gingelly cake (50ml)

Plate-12 and Table-8
TABLE – 12

The influence of soil administration of 100ml of 25% sheep's blood , 50ml of 25% sheep's blood+50ml of 1% Azospirillum, 50ml of 25% sheep's blood+blood+50ml of 1% Phosphobacterium.

Values are the average of two individual experiments in duplicate.

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
Control A)	25	-	12	6	3
100ml 25% Sheep's blood (B)	44 (76%)	3	30 (150%)	11 (83.3%)	5.7 (90%)
50ml 25% Sheep's blood + 50ml 1% Azospirillum (C)	40 (60%)	4	34 (183.3%)	10.2 (70%)	5.5 (83.3%)

50ml 25% Sheep's blood +50ml 1% Phospho-bacterium (D)	34 (36%)	3	32 (166.6%)	9.5 (58.3%)	5.2 (73.3%)

A- Control seedlings received water treatment only.

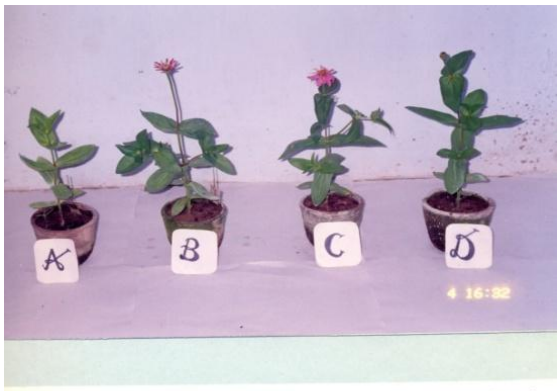

Plate -11: 9 weeks old zinnia seedlings received soil administration of
A - Control (water treatment)
B - 25% sheep's blood solution (100ml)
C - 25% sheep's blood solution (50ml) + 5% fermented groundnut cake (50ml)
D - 25% sheep's blood solution (50ml) + 5% femented gingelly cake (50ml)

Plate-14 and Table-9

TABLE – 14

The effect of soil administration each of 200ml 25% Hibiscus leaf extract, Curry leaf extract, Tulsi leaf extract on the growth parameters of Zinnia seedlings.

Values are the average of two individual experiments in duplicate.

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
Control A)	**45**	**2**	**18**	**3.5**	**1.6**
200ml 25% Hibiscus leaf extract (B)	**48 (6.6%)**	**2 (0%)**	**30 (66.6%)**	**7.5 (114.2%)**	**4.5 (181.25%)**
200ml 25% Curry leaf extract (C)	**55 (22.2%)**	**3 (50%)**	**40 (183%)**	**6.1 (74.2%)**	**3.9 (143.75%)**

200ml 25% Tulsi leaf extract (D)	**50 (11.1%)**	**5 (150%)**	**50 (266%)**	**8.9 (154%)**	**5.2 (225.3%)**

A- Control seedlings received water treatment only.

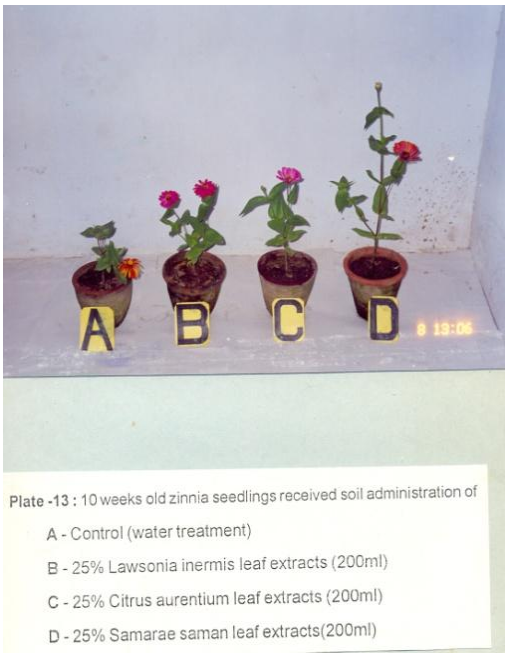

Plate -13 : 10 weeks old zinnia seedlings received soil administration of
A - Control (water treatment)
B - 25% Lawsonia inermis leaf extracts (200ml)
C - 25% Citrus aurentium leaf extracts (200ml)
D - 25% Samarae saman leaf extracts(200ml)

Plate-15 and Table-10

TABLE – 15

The influence of soil administration of 100ml of 25% Samarae saman leaf extract + Ecohume foliar spray, 50ml of 25% Samarae saman leaf extract + 50ml of 25% Samarae saman bud extract +Cytozyme foliar spray and 100ml of 25% Samarae saman bud extract + Agromin foliar spray on the growth parameters of Zinnia seedlings.

Values are the average of two individual experiments in duplicate.

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
100ml 25% samara saman leaf extract+Ecohume foliar (A)	**36.2**	**2**	**48**	**7.9**	**2.9**
50ml 25% samara saman leaf extract + samara saman bud extract +cytozyme foliar spray (B)	**37 (2.2%)**	**3 (50%)**	**40 (183%)**	**53 (10.4%)**	**3.5 (20.6%)**
100ml 25% samara saman but+Agromin foliar spray (C)	**39 (7.73%)**	**4(100%)**	**50 (266%)**	**62 (29.1%)**	**3.9 (34.4%)**

A- Control seedlings received water treatment only.

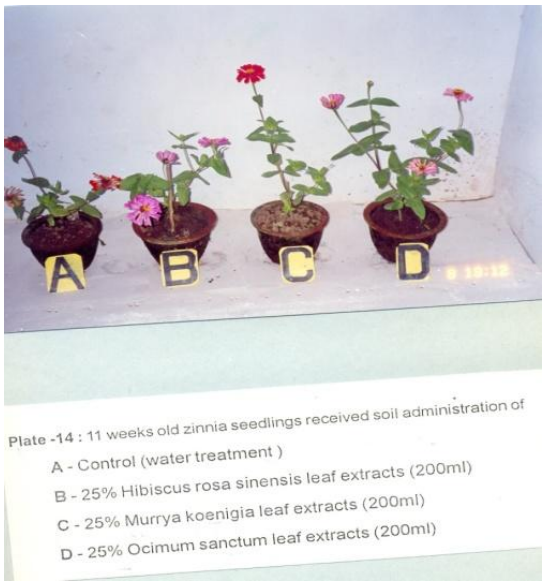

Plate -14 : 11 weeks old zinnia seedlings received soil administration of
A - Control (water treatment)
B - 25% Hibiscus rosa sinensis leaf extracts (200ml)
C - 25% Murrya koenigia leaf extracts (200ml)
D - 25% Ocimum sanctum leaf extracts (200ml)

Plate-16 and Table-11
TABLE – 16

The influence of soil administration of 100ml of 25% Casia siamea leaf extract individually, 50ml of 25% Casia siamea bud extract individually, Casia siamea leaf extract + Becadexamin and Casia siamea bud extract +Becadexamin on the growth parameters of Zinnia seedlings.

Values are the average of two individual experiments in duplicate.

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
100ml 25% Casia siamea leaf extract (A)	38	1	14	48	2.9
10ml 25% Casia siamea bud extract (B)	40 (5.2%)	1	18 (28.5%)	7.3 (52.08%)	3.3 (13.7%)
50ml 25% Casia siamea leaf extract+50ml Becadexamin (C)	42 (10.5%)	3 (200%)	36 (157%)	10.8 (125%)	4.3 (48.2%)
50ml 25% Casia siamea bud extract+50ml Becadexamin (D)	45 (18.4%)	2 (100%)	26 (85.7%)	8.8 (83.3%)	4 (44.8%)

A -Control seedlings received water treatment only.

Plate -15 : 11 weeks old zinnia seedlings received soil administration of
A - 25% Samarae saman leaf extracts + Ecohume foliar spray
B - 25% Samarae saman leaf extracts + 25% Samarae saman bud extracts+ Cytozyme foliar spray
C - 25% Samarae saman bud extracts + Agromin foliar spray

Plate-17 and Table-12

The influence of soil administration of 50ml of 25% Samarae saman bud extract + 50ml Supradyn, 50ml of 25% Samarae saman leaf extracdt +50ml of Supradyn, 50ml of 25% Samarae saman bud extract +50ml of Zincovit and Samarae saman leaf extract + 50ml of Zincovit on the growth parameters of Zinnia seedlings.

Values are the average of two individual experiments in duplicate.

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
50ml 25% samara saman bud extract +50ml supradyn (A)	38	1	20	7.9	2.1
50ml 25% samara saman leaf extract +50ml supradyn (B)	39 (8.3%)	2 (100%)	38 (90%)	10.3 (30.0%)	4.1 (95.2%)
50ml 25% samara saman bud extract +50ml Zincovit (C)	42 (16.6%)	1	26 (30%)	9.1 (15.1%)	3.2 (52.3%)
50ml 25% samara saman leaf extract +50ml Zincovit (D)	43 (18.4%)	1	28 (40%)	9.8 (24%)	3.9 (85.7%)

A- Control seedlings received water treatment only.

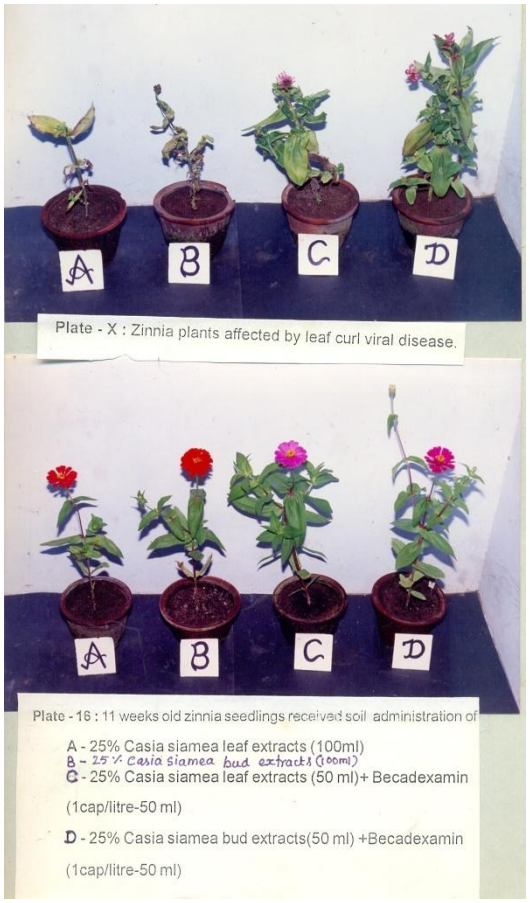

Plate-18 and Table-13

The effect of soil administration of 200ml of 25% onion extract (Allium sativum) and 200ml of 25% garlic extract (Allium cepa) on the growth parameters of Zinnia seedlings.

Values are the average of two individual experiments in duplicate.

Types of treatment	Plant height in cm	No. of branches	No. of Leaves	Leaf size in cm	
				Length	Breadth
Control (A)	45	3	18	3.5	1.6
200ml 25% Allium sativum (B)	49 (8.8%)	3	22 (22.3%)	6.5 (85.7%)	2.5 (56.25%)
200ml 25% Allium cepa (C)	51 (13.3%)	3	28 (50%)	7.5 (114.2%)	4.1 (156.75%)

A- Control seedlings received water treatment only.

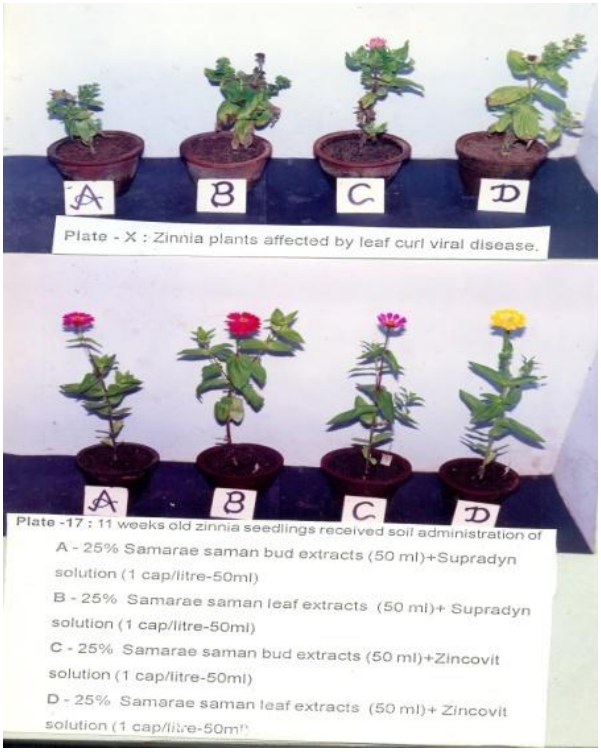

Plate-25 and Table-14

The effect of soil administration of aqueous leaf extract of Casia siamea individually and in combination with fermented ground nut cake and gingelly cake solution on the growth parameters of Zinnia seedlings.

Values are the average of two individual experiments in duplicate.

Types of treatment	Plant height in cm	No. of Leaves	Leaf size in cm	
			Length	Breadth
Control (A)	34	10	12	3.2
100ml 25% Casia Siamea lead extract (B)	39 (14.7%)	16 (60%)	13.1	4.3
50ml 25% Casia Siamea leaf extract +50ml 5% fermented gingelly cake (C)	43.5 (27.9%)	36 (260%)	13.7 (14.16%)	6.5 (103.12%)

50ml 25% Casia Siamea leaf extract + 50ml 5% fermented groundnut cake (D)	**42 (17.6%)**	**20 (100%)**	**13.6 (13.3%)**	**6.0 (39.5%)**

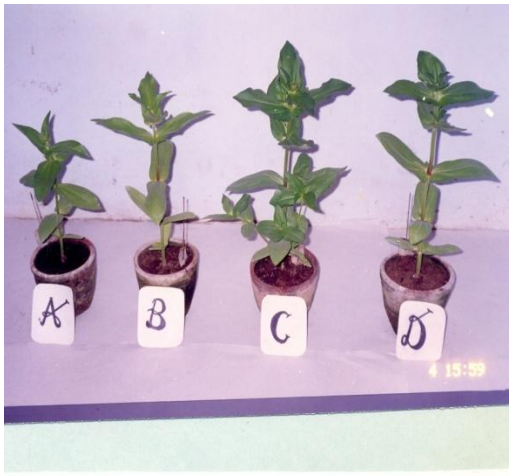

Plate -25 : 10 weeks old zinnia seedlings received soil administration of

A - Control (water treatment)

B -25% Casia siamea leaf extracts (100ml)

C - 25% Casia siamea leaf extracts (50ml) +5% fermented gingelly cake (50 ml)

D - 25% Casia siamea leaf extracts (50ml) +5% fermented ground nut cake (50 ml)

A. Control seedlings received water treatment only.

Considering the importance and usefulness of flowering plants like Zinnia knowledge pertaining to improve its growth is most essential. Eventhough our present work is a small investigation with limited time and other resources, our observation of increased growth performance in almost all growth attributes like plant height, stem girth, number of braches, leaves with lush green foliage and flower size has given us enourmous work in boosting the sale of Zinnia plants. Flowers and seeds as a cottage floriculture industry, creating employment, improving the economic conditions of the farmers, housewives and entertainers enhancing even exports potential. Floriculture is the one of the areas in which India has an inherent strength to dominate the global markets. As we move away from an economy of scarcity to an economy of plenty it is now both possible and necessary for us to fix our sights on the vast opportunities in the export market. The present piece of work also has given us the hope that if we take up this floriculture cottage industry as a national mission, it will definitely play a significant role in given endowment providing employmently opportunities to them enabling them to be financially independent. Thus in the present investigation we have sincerely attempted to mobilize vast pool of our peoples traditional knowledge of eco-friendly nonconventional fertilizers like cow's and sheep's urine, dilute blood solution, fermented cake solution, leaf extract were found to be successful to a large extent when if whole world haven the latest advance in technology. We are sure but our problems traditional knowledge in agricultural will make India a leading agricultural power in the world in 21st century.

3.SUMMARY

1. Soil administration of sheep's urine individually and in combination with different bio fertilizers were found to prevent a leaf curl viral disease in Zinnia seedlings.
2. Soil administration of cow's urine individually and in combination with different bio fertilizers like Azospirillum

and Phosphobacterium were found exhibit a maximum growth performance and early flowering.

3. Soil administration of sheep's urine and in combination with bio fertilizers like Azospirillum and Phosphobacterium were found to exhibit early flowering.
4. Soil administration of different leaf extracts were found to exhibit a marked growth and number of flowers in Zinnia seedlings.
5. Soil administration of different dilutions in sheep's blood was found exhibit early flowering and leaf broadening effect.
6. Soil administration of Samarae saman leaf extracts and in combination with multivitamin tablet like Becadexamin solution were found to be tremendous growth and prevent leaf curl viral disease in zinnia seedlings.

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