EXPERIMENTAL RESULTS

Experiment No.1: Studies on the effect of NAA on the Induction of Flowering in Pineapple plants.

INTRODUCTION

Induced flowering in Pineapple plants by the application of number of plant hormone viz. naphtalene acetic acid (NAA), Beta napthoxy acetic acid (NOXA) was reported by Clark and Kerns from Hawaii in 1942. These hormones stimulated flowering even in their very dilute concentrations of the order of 5 ppm. This was followed by the experiments of Van Overbeek (1945,46) using the three well known hormones, NAA, 2,4-D (2,4-dichlorophenoxy acetic acid) and IAA (Indole acetic acid) in three concentrations, 1 ppm, 5 ppm and 100 ppm, the latter two dosages proved quite effective. Similar experiments conducted by Dr. N.Das and Parua (1968) with above three auxins, in general, found the findings of Van Overbeek, with the notable exception that the effect of 2,4-D was not at par with that found by Van Overbeek. This auxin proved almost ineffective. The pattern of action of IAA was identical with that of 2,4-D.

The concentrations tried in this experiment were - 0, 5, 10, 50 and 100 ppm.
Action of NAA at its Various Concentrations on the Flowering.

Fig. 1

0 5 10 50 Concentration of Auxin in ppm
0 10 20 30 40 Percentage of flowering
80 70 60
Flowering Interval from the Date of NAA Treatment.

Fig 11
Date of treatments: 15.10.69
Total plants under observation: 40

There were altogether 8 plants for each treatment. 20 c.c. of aqueous solution of NAA was poured with a pipette into the heart of the plant.

The age of the plants at the time of application was 5 months only. The daily flower counting was started from the 1st week of February 1970 onwards.

RESULTS

Flower formation: The flowering percentage was found as 37.5%; 75%; 62.5%; and 50% at 5, 10, 50 and 100 ppm respectively as against 12.5% of untreated controls. In each case results obtained from 8 plants were taken into consideration.

It is revealed from the graph (i) that the flowering percentage due to the application of NAA is maximum at 10 ppm and 50 ppm and it slowly falls to about 50 percent at 100 ppm. The effect of NAA was found to be statistically highly significant at 1% probability level (Table 1A). The C.o. was also found significant (Table 2).

Effect of NAA in inducing early flowering:

It is seen from the graph (ii) that there
Chemical Changes in the Leaves

![Graph showing the percentage of sugar in leaves](image)

- **Fig. III**
- **T** = Treated
- **C** = Control

![Graph showing acid content in mg/gm](image)

- **Fig. IV**
was earliness in flower initiation by about 10 days due to application of NAA at the range of concentrations used in the experiment, the effect being more pronounced at the concentrations 5 and 10 ppm causing earliness by about 10 days. In order to ascertain whether or not this earliness is statistically significant, analysis was performed (Table 5A) and found to be highly significant in inducing early flowering. The C.D. was also found significant.

Chemical changes in the leaves after Treatment:

Estimation of total sugar, reducing sugar, acid content of Auxin treated and untreated control sample of the leaves was done. The estimation of nitrogen content of Auxin treated and untreated control sample was also worked out. It is revealed that sugar content of NAA treated plants was slightly higher than the control as shown in the graph (iii) but in case of acid and nitrogen content there was not much difference between the Auxin treated and untreated control samples, (Graph iv) which means that nitrogen and organic acid content does not undergo any change due to auxin application.

Carbohydrate/Nitrogen ratio (C:N) was also worked out and the ratio is 5.27 in case of NAA treated plant and in the case control it is 4.42.
Experiment-2. Effect of Beta Napthoxy Acetic Acid (NOXA) on the Induction of Flowering in Pineapple:

INTRODUCTION:

Beta napthoxy acetic acid evokes physiological responses in plants similar to those of the numerous synthetic substances. Beta napthoxy acetic acid is more toxic than its close relative alpha NAA producing detrimental effect at a concentration as low as 1 p.c. specially in harbaceous plants. Another specific differences lies in its inducing positive curvatures, thus inhibiting growth by elongation at concentration which appear to be optimum for root growth induction (S.C. Bausor 1939).

Koefli, Thimann and Went (1937) re-examined the properties of most of the known growth substances and brought forward the generalization that a closed ring system with double bonds and a side chain containing carboxyl group at least one carbon atom removed from the ring were necessary constituents of a growth substance. Both alpha NAA and Beta NOXA fall within these minimum requirement for a growth substance.
Action of NOXA at its various concentrations on the flowering.

Fig. 1

Concentrations of Auxins in ppm.
Present experiment aimed at enhancing our knowledge on the action of Beta napthoxy acetic acid (NOXA) in the mechanism of flower formation in Pineapples.

In this experiment a range of concentration, namely 0, 5, 10, 50 and 100 ppm was considered.

Date of Treatment: 15.10.69
Age of the slips at the time of application: 6 months (approx.).
Total plants under treatment: 40
No. of plants for each concentration: 8.

20 ml of aqueous solutions of NOXA was applied in four different levels to assess the magnitude of effect of this chemical in individual dose on Pineapple plants. The application was made in the month of October 1969. Necessary observation were made subsequently.

RESULTS

Flowering: Pineapple plants were forced to flower prematurely after 120 days from the date of treatment with aqueous solution of Beta napthoxy acetic acid.

The flowering percentage due to the application of NOXA at different concentration was 75% at 5 ppm, 37.5% at 10 ppm, 50% at 50 ppm and 37.5 at 100 ppm. But in case of untreated control it was only 12.5%.
Chemical changes in the leaves

Sugar

Fig. 1

C = Control.
T = Treated.

Acid

Fig. 1v

Acid content mg/gm.

Flowing Interval from the Date of NOXA Treatment.

Fig. 11

Concentrations of Auxin in ppm.
Graphical representation (Fig. 1) of flowering percentage shows that the percentage is maximum at 5 ppm and 50 ppm. 10 ppm caused 37.6% flowering, equal to that of 100 ppm.

The effect of NOXA was found to be highly significant (Table 1A) probability level. C.D. was also found significant.

**Flowering Intervals**

Plants treated with 5, 10, 50 and 100 ppm of NOXA, the intervals required for the appearance of inflorescence from the date of treatment were 136.5, 130, 119 and 132 days respectively as against 149 days for controls from the same date.

There was earliness in flower initiation by about 14 days due to the application of NOXA. The effect being more pronounced at the concentration of 10 and 50 ppm causing earliness by about 18 and 29 days respectively (graph ii). NOXA was found to be statistically significant in inducing early flowering (Table 5) and C.D. was also found significant.

**Chemical changes in the leaves after Treatment**

Sugar: Percentage of sugar i.e. total Sugar, Reducing Sugar and Non-Reducing sugar obtained in untreated plants
is 3.10, 1.52 and 1.52 respectively, whereas 3.80, 1.62, and 2.18 gms of sugar per 100 gms of materials are obtained from the leaves treated with NOX(1 graph iii).

**Total Titrable Acid** — Fresh leaves are collected from the field treated with the chemical and the acidity was determined. Very slight decrease in acid number was obtained in treated leaves over the control i.e. 2.049 mg/gms in treated and untreated leaves and 2.084 mg/gms in untreated leaves (graph iv).

**Nitrogen** — Nitrogen estimation was also done. Nitrogen present in the leaves treated with NOX is more or less same with that of the untreated control leaves i.e. 0.74% and 0.7% respectively.

The C:N ratio is 5.27 in case of treated plants and 4.42 in case of untreated control plants.
Experiment No. 3: Effect of 2, 4-Dichlorophenoxy acetic acid (2, 4-D) on Induction of Flowering in Pineapple.

I INTRODUCTION:

Potentiality of 2, 4-D as a highly effective herbicides has been universally proved. Like other synthetic hormones, viz. IAA and NAA, it stimulates growth of coleoptiles and stem in very low concentrations. Its influence on plant metabolism through respiration is also well known.

2, 4-D accelerates respiration in pea and oat tissues with low concentrations and it inhibits with higher concentrations (Kelly and Avery 1949). Van Overstreek (1948) reported forced formation of floral primordia in Pineapple after application with 5 and 10 ppm of 2, 4-D. But Das Das and Faruah (1968) did not get any satisfactory result with 2, 4-D in Pineapple.

According to Skoog (1951) 2, 4-D may be effective in releasing bound natural auxins from protein surfaces where it is held inactive, so that it becomes free and available to effect growth. Weintraub (1951) Manderson and Deese (1954) confirmed Skoog's view of the effect of 2, 4-D on endogenous auxin in a manner suggested by Skoog.
Inhibition of flower formation with 2,4-D at different concentrations.

Fig. 1

Percentage of flowering

concentration of Auxin in ppm.
The primary object of this investigation is to examine the mode of action of 2,4-D in the mechanism of flower formation in pineapple.

In this particular experiment a range of concentration namely 5, 10, 50 and 100 ppm was considered.

Date of Application of aqueous solution of hormone = 15.10.69. Age of the plants at the time of treatment = 6 months approx.

The aqueous solution was directly poured by means of a pipette to the heart of the pineapple plant.

Necessary observations were made subsequently. The amount of aqueous solution received by the individual plants 20 ml.

RESULTS

After the application of the auxin solution, leaves become slender, narrow, and thick. It was manifested in curvature of the leaves, constriction at their bases. These symptoms were mainly exhibited in concentration higher than 10 ppm.

Flower Formation: Graphical representation of 2,4-D on flowering as illustrated in Fig (1) shows the inhibitory effect of this chemical on the flowering in pineapple. At 5 ppm only the flowering percentage was 25%.
Chemical changes in the leaves

Sugar

Fig. 11

Acid

Fig. 14

C = Control
T = Treated

Percentage of Sugar

Acid content in Mg/gm

Total Reducing Non Reducing

Interval of Time

Time Interval in Days

Concentration in ppm

Fig. 11
as against 12.5% in control. But at 10, 50 and 100 ppm the flowering percentage was 0%. It indicates that with the increase of concentration the inhibitory effect is more.

The inhibitory effect of 2,4-D on flower formation was found to be statistically significant.

Time Interval from treatment to flowering:

Although 2,4-D caused delay on the onset of flower formation, but surprisingly enough it was only 29 days at 5 ppm as against 148 days of the control as shown in the graph (iii).

Statistical analysis (Table 6) shows the delaying effect of 2,4-D on flower formation.

Chemical changes in the leaves after treatment:

There was no any notable difference in the chemical constituents of the leaves.

Total sugar, reducing sugar and non-reducing sugar present in the treated leaves were 3.40%, 1.54% and 1.68% respectively as against 3.10%, 1.52 and 1.68% in control (graph iii).

Nitrogen and total Titratable acid present in the treated leaves were 0.7% and 1.934 mg/gm respectively. C:N ratio was 4.47 as against 4.42 in untreated control.
Experiment No.4: Effect of Ascorbic Acid on Induction of Flowering in Pineapple.

INTRODUCTION:

Since the isolation and identification of vitamin C (Suirbely 1932) there has been much investigation regarding the role of this physiologically important substance. The term "ascorbic acid" was first proposed by A.Smit-Gyósgi.

Davis and Hudson (1937) reported that in concentration, 1:10,000, the vitamin has a stimulating effect on germinating seeds, higher concentration retarding development.

The work of Reid (1937) shows that the percentage of ascorbic acid in the tissues increases up to the time of ripening. Highest concentration is in the leaf, leaf buds and blossoms, respectively lowest concentrations is in the roots.

Favas (1935) found that a concentrations of 1:110,000, was optimum for growth of tomatoes. Tomatoes treated with a 1:10,000 concentration showed no acceleration of growth or flowering and had a smaller no of fruits but with 20% greater total weight.

Present experiment aimed on the action of Ascorbic acid in the mechanism of flower formation in Pineapples.
Action of Ascorbic Acid at its Various Concentrations on the Flowering

**Fig. 1**

- Concentration in ppm
- Percentage of flowering
Concentrations tried in this experiment were 10, 20, 50 and 100 ppm.

Date of Treatment = 17.10.69
Age of the Suckers at the time of treatment = 6 months approximately.
Total plants under treatment = 40
No. of plants for each concentration = 8.

20 ml. of aqueous solution of Ascorbic Acid was applied in four different concentration on the heart of the Pineapple plants.

The application was made in the month of October 1969.

RESULTS

Flowering ♦ - The percentage of flowering due to the application of Ascorbic Acid at different concentration was 50.0%, 37.5%, 62.5%, 75.0% at 10, 20, 50 and 100 ppm respectively, whereas it was only 12.5% in the untreated control.

Graphical representation (Fig 1) shows that the flowering percentage is increase with the increase of concentration. The maximum percentage of flowering is in the 100 ppm and the minimum is at 20 ppm.

The effect of Ascorbic acid on onset of flowering was found to be statistically significant.
Chemical Changes in the Leaves

**Sugar**

C = Control.
T = Treated.

**Acid**

**Flowering Interval from the Date of Ascorbic Acid Treatment**

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Fig. 1:** Sugar

Fig. 2:** Acid

Fig. 3:** Flowering Interval from the Date of Ascorbic Acid Treatment
Interval of time: It is revealed from the graph (ii) that there was earliness in flower initiation due to the application of Ascorbic acid by about 10 days. The effect is being more pronounced at 50 ppm, causing earliness by about 17 days.

Statistical analysis shows that this earliness is statistically significant.

Chemical changes in the leaves after treatment:

Total sugar, reducing sugar and non-reducing (in percentage) obtained from the treated leaves were 3.20%, 1.56%, 1.64% as against the 3.10%, 1.52% and 1.58% in untreated control respectively.

Total Titratable Acid and Nitrogen: The titratable acid present in the treated leaves = 1.034 mg/gm and in control it was 2.084.

Nitrogen percentage was 0.72 and 0.7 in treated and untreated leaves respectively. This shows that there was not much difference in nitrogen and organic acid content between the auxin treated and untreated plants.

The carbohydrate/Nitrogen ratio was 4.44.

All these data are graphically represented in the Fig. (iii) and (iv).
Experiment No.5: Effect of Gibberellic Acid on Induction of Flowering in Pineapple.

INTRODUCTION

Rice plants infected with bakanae disease displayed accelerated growth in elongation and came to flower earlier than their counterparts (Hori 1898). Yabuta and his co-workers (1941) observed rapid onset of flowering in tobacco after treatment with Gibberellins.

Many vegetable crops responded to G.A. which reflected in increased stem elongation or in earlier flowering (Wittwer and Bucovac 1957).

Das and A. Boruah (1968) found that G.A. was ineffective in inducing flower formation in Pineapple.

The concentrations tried in this experiment were 9, 5, 10, 50 and 100 ppm.

Date of Application = 17.10.69
Age of the Suckers at the time of application = 6 months (approx).
Total plants under investigation = 40
Plants under each concentration = 8
Aqueous solutions of the chemical was poured into the heart of the plants.
Action of G.A. at its various concentration on the flowering.

**Fig 1**

- Concentration of G.A. in ppm
- Flowering Percentage
RESULTS

Flower formation:

The percentage of flowering, due to the application of Gibberellic acid was 50%, 37.5%, 37.5% and 50% at 5, 10, 50 and 100 ppm respectively, as against 12.5% of untreated control.

In no concentration the flowering percentage was recorded below that of the control.

From the graph (1) it is revealed that the flowering percentage is maximum at 5 and 100 ppm. The effect of G.A. was found to be statistically highly significant at 1% probability level. The C.D. was also found significant (Table 1A) and (Table 2) respectively.

Effect of G.A. in inducing early flowering:

Plants treated with, 5, 10, 50 and 100 ppm of G.A. the intervals required for the appearance of inflorescence in Pineapple from the date of treatment were 141.5, 128, 145, 128.5 days respectively as against 148 days for controls from the same date.

There was earliness in flower initiation by about 11 days. The effect being more pronounced at 10 and 100 ppm. In order to ascertain whether or not this
Sugar

- C = Control
- T = Treated

![Sugar Graph]

Acid

![Acid Graph]

Flowering Interval from the date of GA Treatment.

![Flowering Interval Graph]
earliness is statistically significant, analysis was performed (Table 5) and found to be highly significant in inducing early flowering.

Chemical changes in the leaves after treatment:

Sugar: Percentage of sugar, i.e. total sugar, reducing sugar, and non-reducing sugar obtained in untreated plants is 3.10, 1.52 and 1.58 respectively whereas 3.45, 1.56 and 1.89 of sugar per 100 gms of materials were obtained from the leaves treated with Gibberellic acid.

Total titratable acid and nitrogen: There was no appreciable change in respect of total titratable acid and nitrogen content due to treatments. The results of the chemical analysis were shown in Fig (iii) and (iv).

Carbohydrate and Nitrogen ratio (C: N) was 4.72.
EXPERIMENT No. 6: Effect of Indole Propionic Acid on Induction of Flowering in Pineapple.

INTRODUCTION:

Indole Propionic acid was discovered by Zimmerman, Hitchcock and Wilcoxon in 1935. Gustafson (1936) was able to induce seedless fruit in watermelon by applying 1.0 percent solution in lanolin of IPA, spraying the female flowers of American holly (*Ilex opaca*) with dilute solution of IPA also produced penthenocarpic fruits (Gardner and Marth 1937).

Present experiment aimed at enhancing our knowledge on the action Indole-3-Propionic acid (IPA) in the mechanism of flower formation in Pineapples.

The concentration tried in this experiment were 5, 10, 50 and 100 ppm.

Date of treatment: 19.10.69.
Total plants under observation = 40
There were altogether 8 plants for each concentration. 20 ml of aqueous solution of IPA was poured with a Pipette into the heart of the plant. The age of the plant at the time of application was 6 months (approximately).
Action of IPA on its various concentration on the flowering.
RESULTS

Flower formation:

The flowering percentage due to the application of IPA was 12.5%, 62.5%, 50%, 25.0% and 37.5% at 0, 5, 10, 50 and 100 ppm respectively.

It is revealed from the graph (i) that the percentage of flowering is maximum at 5 ppm and it slowly falls down to about 50.0% at 10 ppm and then to 25.0% at 50 ppm, and again gives rise to 37.5% at 100 ppm.

The effect of IPA on flower initiation was found to be statistically significant (Table 1A) both at 1% probability. The C.D. was also found significant.

Time Interval:

Plants treated with 5, 10, 50 and 100 ppm of IPA, the intervals required for the appearance of flowers from the date of treatment were, 138, 142, 135 and 143 days respectively as against 148 days for controls from the same date.

Graph (ii) shows the maximum days at 0, ppm i.e. control = 148 days. There was a earliness due to the treatment by about 9 days. But at concentration 5 and
Chemical Changes in the Leaves

Sugar

Fig. III

C = Control
T = Treated

Acid

Fig. IV

Concentration in ppm

Time Interval in Days

Flowering Interval From the Date of IPA Treatment

Fig. II
50 ppm, there was a carliness by about 10 and 13 days respectively.

The carliness of flowering was statistically analysed and found to be significant (Table 5A).

Chemical changes in the leaves:

Total sugar, Reducing sugar and non-reducing sugar present in the leaves which was treated with IPA - 3.30%, 1.54% and 1.76% respectively.

Nitrogen and Total titratable Acid present in the leaves were 0.73% and 1.984 mg/gm respectively as against 0.7% and 2.084 mg/gm in control. There was no any notable difference in the chemicals between the treated and untreated plant leaves.

Carbohydrate/Nitrogen ratio is 4.52.
All these datas are graphically represented Fig (iii) and (iv).
EXPERIMENT No.7 : Studies on the effect of Methyl Napthalene Acetic Acid on the Induction of Flowering in Pineapple.

: INTRODUCTION :

In recent years attempt has been made by plant physiologists to explore the mode of action of auxin-antagonists on the flowering and inhibition of root growth behaviour of plants, and M.N.A.A being one among them was tried. Both auxin and antiauxins may have virtually the same action on root growth when supplied externally (Andus and Shipton 1952).

The antagonism of auxin inhibition by anti-auxins mean that these two classes of compound must complete with each other for the growth centres where this inhibition is taking place. The anti-auxin, having a very low inhibiting activity, may replace the highly active auxins at these centres, thus partially releasing the auxin inhibition.

Both auxins and antiauxins in stimulating root growth are exerting identical physiological actions in the same growth system. (Andus and Das 1954).

In this experiment M.N.A.A. used in order to promote flowering by an act of antagonism with native
Effect of Methyl Napthalene Acetic Acid
on Flowering

Fig 1
auxin 1AA in the plant.

The experimental design included a series of its concentrations viz. 0, 50, 100, 150 and 200 ppm in aqueous solution applied to the centre of the plants.

Date of application: 17.10.69
Age of the plants at the time of application: 6 months
(approxly)
Total plants under observation: 40
Number of plants for each concentration: 2.

RESULTS:

Flowering:

A slight increase in flowering percentage with 100 and 150 ppm concentration of M.N.A.A. was the result. The percentage was 62.5% and 37.5% at 100 and 150 ppm respectively. In control it was 12.5%. But at concentration 50 and 200 ppm no flowering was observed.

Graphical representation (Fig 1) of the data shows that percentage of flowering is maximum at 100 ppm and immediately it comes down to 37.5% at 150 ppm. Then this is again coming down to 0% at 200 ppm.

The effect of M.N.A.A. was statistically not significant (Table 2).
Chemical Changes in the leaves.

**Fig. III**

**Sugar**

- C = Control
- T = Treated

**Fig. IV**

**Acid**

**Interval of Time**

**Fig. II**

**Time Intervals in Days**
FLOWERING INTERVALS:

Plants treated with 50, 100, 150 and 200 ppm of M.N.A.A., the intervals required for the appearance of flowers from the date of treatment were 0, 21, 115 and 0 days respectively as against 148 days for controls (Fig 11).

At 100 and 150 ppm there was a earliness by about 67 and 33 days respectively. Statistically (Table 7B) the overall effect of M.N.A.A. was found to be not significant.

Chemical Analysis:

Total sugar, reducing sugar and non-reducing sugar (in percentage) obtained from the treated leaves were 3.20%, 1.50%, and 1.62% respectively. There was no any notable difference in sugar content between the treated and the control leaves (Fig III).

Total Titratable Acid and Nitrogen: The total titratable acid present in the treated leaves - 1.980 mg/gm (Fig iv) and in the control it was 2.034. The nitrogen percentage was 0.74% and 0.7% in treated and untreated leaves respectively.

The carbohydrate/Nitrogen ratio was 4.32.
EXPERIMENT No.8: Effect of Calcium Carbide on Flowering in Pineapple.

: INTRODUCTION :

It was first observed in the Azores Island that smoke can force the Pineapple plant into early flowering. An investigation of the active components of smoke showed that its effect is due to unsaturated hydrocarbons principally ethylene. Acetylene also was found to be active (A.G. Rodriguez 1982).

Induced flowering in Pineapple, later-on on reported by Cooper and Reece in 1942 by the use of acetylene.

Similar experiments were conducted by Ras and Boruah (1968) under the agro-climatic condition of Assam and confirmed the findings of Cooper and Reece.

Present investigation was conducted with a view to determine the potentiality of Calcium Carbide in induction of early flowering in Pineapple.

Date of Treatment : 20.10.69.
Age of the plant at the time of treatment = 6 months (Approxly).
Total plants under treatment = 40
Number of plants for different doses = 8.
Effect of Ca-carbide on flowering.

Flowering percentage vs. levels of Ca-carbide.

Fig. 1
Solid calcium carbide in doses of 0.5 gm, 1 gm, 1.5 gm and 2 gms was placed into the heart of the plant. This added carbide by reacting with moisture or rain water liberated acetylene gas which in turn promoted early flowering.

RESULTS:

Flower formation:

The percentage of flowering due to the application of solid calcium carbide at different doses was 12.5%, 12.5%, 0%, 37.8% and 0% at 0, 0.5 gm, 1 gm, 1.5 gm and 2 gms respectively.

Graphical representation (Fig 1) of the data shows that the flowering percentage is maximum at 1.5 gms of Ca-Carbide. No response was found at 1 gm and 2 gms of Ca-Carbide.

The effect of Ca-Carbide was found to be statistically not significant (Table 3B and 4).

Interval of time from the date of Treatment:

Plants treated with 0.5 gm and 1.5 gms of Calcium Carbide the intervals required for the appearance of inflorescence was 140 and 96 days respectively whereas in control plant it was 148 days.
Fig. 111  Chemical Changes in the leaves

Sugar

C = Control
T = Treated.

Acid

Interval of Time From the Date of Treatment.

Calcium Carbide in gms
There was earliness in flower initiation by about 8 days in case of 0.5 gms and the effect is more pronounced at doses of 1.5 gms, causing earliness by about 58 days.

Statistical analysis shows that this earliness is statistically significant (Table 8).

Chemical change in the leaves:

Sugar estimation, Nitrogen estimation and total titratable acid content in the leaves was determined by the procedure given in the chapter II.

The percentage of sugar i.e. total sugar, reducing sugar and non-reducing sugar present in the Pineapple leaves which was treated with solid calcium carbide was 3.30%, 1.53%, 1.77% respectively as against 3.10%, 1.52% and 1.58% in control.

Nitrogen and total titratable acid content in leaves was 0.73% and 2 mg/gm respectively as against 0.7% and 2.089 mg/gm in untreated plants.

The C:N ratio was 4.52 (treated) and 4.42 (control).
INTRODUCTION

The role of Indole 3- acetic acid and other Indole compounds in the flowering process in vague. Recent evidences suggest that IAA applied to short day plants inhibits flowering while anti-auxins can reverse the inhibition. The flowering of long day plant grown under long day conditions can also be inhibited by applied auxin, and long day plants grown under short day conditions can be induced to form floral primordia with applied IAA. A balance between auxin and florigen has postulated to regulate flowering in some short day species. An important adjunct to these observations and postulates would be experimental evidence that the levels of IAA in short day plants are actually decreased during or after photoinduction and that corresponding vegetative short day plants of comparable age show quantitative increase in IAA (A.J. Vliitos and Werrer 1954).

There was a marked increase in the no. of flowers (in Pineapple) following the application of the two auxins viz. NAA and IAA singly and in combinations (Das and Bornah 1968).
Effect of IAA (on concentration) on flowering.

Fig. 1

Flowing Percentage

Concentration in ppm
In this experiment only IAA was tried singly with the concentration 5, 10, 50 and 100 ppm.

Date of Treatment: 20.10.63.

Age of the Suckers at the time of application: 6 months (Approxly).

Total plants under treatment: 40

Number of plants for each concentration: 8.

20 ml of aqueous solution of Indole-3 acetic acid was applied in four different levels in the month of October 1963 to the heart of the young Pineapple plants.

RESULTS:

Flower formation:

The percentage of flowering due to the application of IAA was not satisfactory. Flowering percentage found in different concentrations - 12.5%, 0%, 12.5%, 12.5% respectively and in untreated control it was also 12.5%. The effect of IAA was found to be statistically not significant (Table 2) both at 5% and 1%.

Flowering Interval:

Plants treated with 5, 10, 50 and 100 ppm of IAA the intervals required for the appearance of flowers from the date of treatment were 143, 0, 143 and 150 days.
Chemical Changes in the Leaves

**Sugar**

C = Control  
T = Treated

**Acid**

Acid Content in mg/gm

Time Interval from the date of Treatment

Concentration of 1% NaCl 5% NaCl
respectively as against 142 days for controls from the same date.

There was no earliness of flower initiation due to the application of IAA. Only at concentration 5 ppm there was earliness only about 5 days. Slight delay in flower initiation was noticed at 50 and 100 ppm (Fig. 11). Statistical analysis (Table 6) shows the delaying effect of IAA on flower initiation.

Chemical changes:

Total sugar, reducing sugar and non-reducing sugar (in percentage) obtained from the treated leaves are 3.36%, 1.54% and 2.12% as against, the 3.10%, 1.52% and 1.58% in untreated control respectively.

Total titratable acid and nitrogen: The total titratable acid present in the treated leaves = 2.048 mg/gm and in control it was = 2.044 mg/gm. Nitrogen percentage was 0.71 and 0.7 in treated and untreated leaves respectively.

Carbohydrate/Nitrogen ratio is 4.73.
Relative efficiency of different hormones in their optimal concentration on the flowering percentage of pineapple.
Relative efficiency of different hormones in their optimal concentration on the flowering percentage of Pineapple.

The relative efficiency of different hormones in their optimal concentration on the flowering percentage of Pineapple is graphically represented (Fig I).

It is revealed from the graph that 5 ppm is the optimal concentration for B-naphthoxy acetic acid (75%) l pA (62.5%); G.A. (50.0%) and 2,4-D (25.0%).

Whereas 10 ppm is optimal concentration for NAA (75.0%) only.

In case of IAA it is 50 ppm (12.5%). But for Ascorbic acid and M.N.A.A. 100 ppm is the optimal concentration. Flowering percentage 75.0% and 62.5% respectively.

This shows that there is a notable differences between the concentration of hormones and the flowering percentage in pineapple.