



APPLICATIONS OF SYNTHETIC HORMONES
, PLANT GROWTH RETARDENTS AND
INHIBITORS FOR VARIOUS PURPOSES IN
VEGETABLE CROPS

SYNTHETIC PLANT HORMONE

- ▶ Produced artificially and similar to natural hormone in physiological activity .Also called exogenous hormone
- ▶ Example : Indole acetic acid (IAA) is plant hormone .
- ▶ Where as synthetic auxins are divided in to 3 groups .they are indole group, naphthaline group , phenoxy group.

EXAMPLES OF SYNTHETIC HORMONES

Auxins :

- ▶ Indole group : IBA (indole buteric acid) it is also called as rooting hormone .it is used for formation of roots stem cuttings.
- ▶ Naphthaline group: NOA (2- β Naphthoxy acetic acid) it is used to induction of fruit set and aslo used for the parthenocarpy fruit development.
 - MENA (methyl esters of naphthalene acetic acid) it is used for prolonging dormancy and increase the storage life of potatoes.
- ▶ Phenoxy group: 2,4-D (2,4 Dichlorophenoxy acetic acid) at lower concentration it is used for the control of fruit drop and at higher concentration used for the control of broad leaved weeds .
 - 4-PCPA (4 Para Chloro Phenoxy Acetic acid).
 - MCPA-(2-Metyl 4-Chloro Phenoxy acetic acid).
 - 2,4,5 TP (2,4,5 Trichloro phenoxy acetic acid).

Condt.....

- Examples of synthetic cytokinins: adenine, kinetin, benzyl adenine ,zeatin.
- examples of synthetic gibberellins : In gibberellins GA3 is commercially used and others are GA4 and GA7
- Examples of ethylene : ACC, estacelasil , ethopone , glyoxime.

Application of synthetic growth regulators on vegetable crops for various purpose

Growth regulators	Quantity (mg /l)	Mode of application	crop	impact
2,4-D	0.5	Foliar spary	Tomato	Fruit set and yield
2,4,5 T	75-100	Foliar spray	Potato	Improve shelf life in storage
PCPA	50	Foliar spray	tomato	Increase fruit set under high and low temperature
NAA	10 -20	Foliar spray	Chilli , tomato	Prevents flower drop and increase fruit set
IBA	0.2	Seedling root dip	Cole crops	Better establishment and growth and yield
GA3	10-25	Tuber dip ,foliar spray	Potato ,water melon ,tomato	Breaking of dormancy ,sex expression ,fruiting and yield
	50 -100	Seed treatment or foliar spray	Okra ,tomato ,brinjal	Enhances seed germination ,fruit set and yied.

GA3	50	Foliar spray	Lettuce ,Chinese cabbage	Increase dry matter ,protein and absrobic acid content
	5-15	foliar spray	Cauliflower,ca bbage	Increases head or curd size
Kinetin	8	dipping	lettuce	Self life and quality of leetuce head
BA	5-20	Post harvest dip	cauliflower, onion,snap bean	Enhance shelf life
Ethephon	100-250	Foliar spray	Tomato ,cucurbits ,okra	Fruiting ,flowering ,sex expression and yield.

GROWTH RETARDANTS

- ▶ crops to reduce unwanted longitudinal shoot growth without lowering plant productivity. Most of the growth retardants are applied in agronomic and horticulture the retardants act by inhibiting gibberellin (GA3) biosynthesis so gibberellins are also known as anti-gibberellins .
- ▶ Example : paclobutazol , CCC or chlormequat chloride (chloro-choline chloride), SADH (succinic acid -2 ,2-dimethyl hydrazine) , cycocel.

APPLICATION OF GROWTH RETARDANTS

- Use of chlormequat as foliar spray ($3-6\text{kg ha}^{-1}$) or as soil application (6kg ha^{-1}) or as seed treatment (1% solution) improves the water stress resistance and yield of pea
- CCC application of 250 ppm in foliar spray in potato it increases TSS and vitamin c content in tubers.
- In tomato application of CCC of 250 ppm in foliar spray or seedling dip impacts flowering, fruiting, resistance to TLCV.
- In okra application of ccc of 250 as seed treatments enhance fruiting and yield and resistance to salt.
- In cucubits application cycocel of 250 to 500 ppm in foliar spray impact in increases sex ratio.

Condt....

- In carrot exogenous application of chlormequat reduce the seed stalk length and induce cold hardiness.
- Post harvest application of cycocel up to 100 ppm concentration reduces chlorophyll loss weight loss and improves the quality and shelf life of broccoli and tomato.
- Spraying of potato haulms with 0.74 kg /ha of ccc causes a short term retardation of growth , stimulates the roots growth and increase resistance of plant to frost.

PLANT GROWTH INHIBITORS

- ▶ Growth inhibitors suppress the growth of the plants . There are phenolic inhibitors and synthetic inhibitors and abscissic acid.inhibitors from *Betula* species prevents the growth the growth of apical bud EX:ABA and dormin.
- ▶ Example : benzoic acid ,salicylic acid, coumarin and chlorogenic acid are examples of phenolic inhibitors,while triiodo benzoic acid (TIBA) and malichyrazide(MH) are examples of synthetic inhibitors

APPLICATION OF SYNTHETIC GROWTH INHIBITORS IN VEGETABLES FOR VARIOUS PURPOSE

- ▶ Maleic hydrazide (MH) -1,2-dihydro-3, 6-pyridazinedione are the chemical names .
- ▶ Application of MH at 2500 ppm 6 weeks before harvesting can prevent sprouting in onion during storage.
- ▶ A combination of MH (1000 ppm) and wax emulsion (1-2%) as post harvest dip and reduce the decay and weight lose ,and extends the storage period of tomato.
- ▶ It has an inhibitory action on sprouting in storage of several vegetable crops like effectively checks sprouting in radish ,onion ,sugar beet and carrot,potato.

Condt.....

- ▶ TIBA 2,3,5-tri – iodobenzoic acid ,application of 25 -50 ppm in foliar spray impact sex expression and yield in cucurbits.

Thank you