

USES AND APPLICATION METHODS OF GROWTH REGULATOR IN FRUIT CROPS

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Abstract

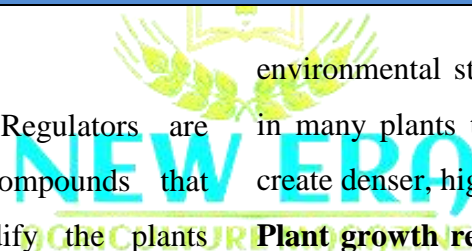
The information about the PGRs and their use for size of fruits, growth regulator like gibberellins can be used, Auxins and Cytokinins may be applied and their interaction effect on the fruit setting and treated cutting. Delay the fruit ripening can be done with the help of PGRs. Fruiton-L and Fruiton-M use for prevent pre harvest fruit drop in fruit. PGRs break bud dormancy in certain fruit crops and also Auxin hormone induces root formation on cuttings and transplants. Ethylene-releasing compounds and auxins are often used for fruit thinning, helping to eliminate excess fruits and ensure the remaining ones develop properly. Depending on the plant material, growth hormones forms of purpose of application. The methods (Vapors, Gases, Paste, Dipping / Soaking, Drenching, and Spraying) which are used commonly adopted in application of growth hormones.

Keywords- PGR, Application method of PGR, Timing of Application

Plant Growth Regulator

The plant Growth Regulators are Synthetic or biological compounds that positively benefit and modify the plants growth under developments. They are also known as plant hormones. PGRs play a crucial role in regulating various physiological processes in plants, including cell division, elongation, differentiation, and responses to

environmental stimuli. They are broadly used in many plants to shorten the internodes and create denser, higher and smaller plants.



Plant growth regulators which we are used in fruit production-

1. Fruit size control

To regulate the size of fruits, growth regulator like gibberellins can be used. They can promote cell division and enlargement,

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influencing fruit size. Ex. In Grapes GA₃ @25, 50, 75, 100 ppm use to improve the size of fruit.

2. Fruit Setting

Auxins and Cytokinins may be applied to enhance fruit setting, ensuring a higher yield by improving the development of fruit from pollination to maturity.

3. Delaying fruit ripening

Ethylene inhibitors or anti-ethylene compounds are applied to delay fruit ripening during transportation and storage, extending the shelf life of fruits, Ex. Gibberellins delay the fruit maturity and senescence in lemon, orange and cherry this help in storing the

fruits, 1-methylcyclopropene (MCP) was @10-50 mg/l (active ingredient) are also as anti-ethylene. It has been used to enhance the postharvest life of fruit and vegetables

4. Preventing Pre-harvest fruit drop

Ethylene inhibitors or synthetic auxins can be used to prevent premature fruit drop before harvest, ensuring a higher yield. NAA commercially sold as Fruitone-L and Fruiton-N @10ppm used for prevent fruit drop in Apple.

5. Breaking bud dormancy

Gibberellins (50- 100 ppm) are often applied to break dormancy in certain fruit crops, promoting uniform and early bud break

Table 1. An agent for thinning fruit sets in apples, pears, olives and some citrus

Timing	Chemical	Trade Name	Rate / 100 gal dilute TRV
Bloom	Naphthaleneacetic acid-sodium	Fruitone-L, PoMaxa, Refine 3.5 WSG, Refine 3.5L	2-4 oz
Petal fall	Naphthaleneacetamide	Amid-Thin W	4-8 oz
	Carbaryl	Sevin XLR Plus, Sevin 4F	0.5 to 1.5 pt
	6-Benzyl Adenine (6-BA)	Maxcel, RiteWay	48-200 oz
8-13 mm Fruit Size	Naphthaleneacetic acid-sodium	Fruitone-L, Pomaxa, Refine 3.5 WSG, Refine 3.5L	2-6 oz
	Carbaryl	Sevin XLR Plus, Sevin 4F	0.5 to 1.5 pt
	6-Benzyl Adenine (6-BA)	Maxcel, RiteWay	48-200 oz
15-20 mm Fruit Size	6-Benzyl Adenine (6-BA)	Exilis plus, Exilis 9.5SC	6.4 to 25.6 fl oz
	Ethephon	Ethrel	1 to 1.5 pt
	Carbaryl	Sevin XLR Plus, Sevin 4F	0.5 to 1.5 pt
	S-Abscisic Acid (ABA)	Protone®	6.6 to 33.1 oz
	Accede	Accede®	23 to 46 fl oz

HCN @1.5-4% in grape.

6. Induces root formation on cuttings and transplants

Trade Name- ROOTING POWDER; ROOTONE (component, with Indole-3-butyric acid and 1-Naphthaleneacetamide); TRANSPLANTONE); VARDHAK @ 1.0 ppm in apple, sweet cherry @ 0.1 ppm, olive @ 0.1 ppm, orange @ 0.1 ppm, pear @1.0 ppm, pineapple @ 0.05 ppm, quince @ 1.0 ppm.

7. Fruit Thinning

Ethylene-releasing compounds and auxins are often used for fruit thinning, helping to eliminate excess fruits and ensure the remaining ones develop properly.

➔ The plant growth hormones are available in different form e. g. - Solid, Liquid and Gases

There are several methods to application of plant growth Regulator

Plant growth Regulator depending on the plant material, growth hormones forms of purpose of application. The following are the methods which are used commonly adopted in application of growth hormones.

1. Spraying-

It is most popular method for application of plant growth hormones to development of fruit quality and increasing Yield of fruit crop. Generally, two types of

sprayers are used for spraying of growth hormones are-

A. High pressure sprayers

B. Low pressure sprayers

❖ After converted in liquid form, Growth hormone Solution (in perfect ratio) is sprayed with the help of Sprayers on plants.

❖ Uniform application of growth solutions is an important aspect for effectiveness in fruits quality and for success to using spraying method, for example-

➤ NAA are applied in the field throw this method for Increase flowering in crop and GA3 are applied for proper cell division in plant.



2. Drenching-

➤ It is one of the most important method for application of plant growth hormones in fruit crops.

➤ The growth regulator solution are applied directly on the best zone of

plant for increasing the root quality, like Initiation of goods and as well as formation of Root hair on the roots.

- Drenching is a specific technique of applying a dilute growth hormone solutions to a particular plant or tree or a specific group of plants.
- In this method we applied the growth hormones solutions at Known Quantity for the plant. IBA is used for root initiation and initiation of root hair then we apply this through trench method.



3. Dipping / Soaking -

Some fruits are dipped in the growth hormones for improving fruit quality and seeds are dipped in the growth hormones solutions to break seed dormancy to increase seed germination rate.

The seeds are soaked in growth hormones solutions for long or short time depending on seed Coat. Raw fruit soaked in solution For Some time and remove them from solution and put out side for ripening.

IBA solution used for treated the cutting of plants for rooting through this method and for increasing the berry size in grape dipping method are used.



4. Paste

Sometimes growth hormones are applied in the paste form depending upon the purpose. The dilute growth hormones solution are dissolved in talcum powder or charcoal powder for preparing the paste. This paste applied on pruned branches, Grafted branches as well as dispatched area for air layering time, with the help of Cotton plug or brush.



At the time of air layering, IBA applied on the cut Section of the branch on the cambium through the help of brush.

This method are also used on top worked plant for proper branching or Shoot Initiation.

5. Gases

This method is suitable for air tight room as well as green house with good air tight door and shutters or pane. The active Compounds growth hormones are spread in air tight room or green house. The growth hormones ore spread in gases form for improving the fruit quality and also effective for early ripening of fruits.

It changes the physiological and biochemical events i.e. Colour, Texture, Flavor and Aroma that makes fruit tasty and attractive also increase storage life of fruit.

Ethrel mostly used for fruit ripening in banana through this method.



6. Vapors

This method is suitable for green house with good air tight doors the active

Compounds or growth hormones Solutions are slowly vaporized in green house to increase the growth and quality of fruit Crops.

Fogger are used four spray the growth hormones in vapor form.

Generally a fogging machine is used to spray certain chemicals in a fine mist.

They are also called fog generators or smoke machines. Through this method significantly improve the efficiency of your fumigation efforts.

Operating a vaporization machine-

- The solution to be applied in Machine obtain firstly.
- Dilute the solution according to the instructors.
- Then we need to wear protective clothing from this stage.
- Than the solution transferred to the vaporization machine and start the machine.
- The machine begins to emit fog / smoke as soon as it is turned on and start spraying.

Conclusion

In conclusion, the use of growth regulators in fruit crops has become a valuable tool for modern agriculture, offering various benefits in terms of yield, quality, and overall crop management. These growth regulators, also known as plant hormones, play a crucial role in influencing plant growth and development.

The information regarding to application method and time for application of PGR at the adequate amount. If the farmer have information about application at the exact part or place thane the use efficiency is increase and increase the productivity at low cost.

