

## Chemical Hybridising Agent A Boon for Plant Breeder

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### INTRODUCTION

These days hybrid seeds are gaining popularity in many crops like in rice, maize, in a lot of pulses etc. Because of hybrid in different crops the yield of different crop increases. To achieve hybridization in self pollinated crop is a tedious process.

To control pollination there are some mechanisms like-

(i) Self incompatibility

(ii) Male sterility

I am going to discuss about male sterility in this article. Male sterile plants are those unable to produce functional pollen grains. This is helpful in creating a desirable cross because the pollen from the male of same flower is non functional. But male sterile strain is not present in all the crops. So to make such crop male sterile it is recommended to use either mutagens or chemicals. By the use of mutagens creating male sterility requires a lot of selections which is a time consuming process. Hence to create male sterility in such plants by the help of chemicals i.e. chemical hybridising agent is fruitful. By this article I am going to explain about the chemical hybridising agents and its role in creating male sterility.

### Chemically induced male sterility-

A lot of chemicals are present which affects the function of male reproductive organ i.e. works like a male gametocides, male sterilants and pollenocides. In 1985 a scientist named McRae suggested a term Chemical hybridising agent (CHA) to such chemicals. These are the chemicals that induce male sterility artificially. Because of this the hybrid seed production in non male sterile plants becomes an easy task.

**Some important chemical hybridising agents-**

- **Arsenicals-**

MG1 (zinc methyl arsenate) and MG2 (sodium methyl arsenate)

Crop- Rice

Doze- MG2@150mg/l

Time of application- 15 days before heading.

Mode of action- Inhibit respiration in anther.

- **Ethephon-**

Crop	Doze	Stage of application
Barley	700-1500 mg/l	Late boot
Mustard	2000-3000 mg/l	Before bud initiation
Pearl millet	2000 mg/l	Late boot
Rice	1000-3000 mg/l	Early boot
Wheat	1000-2500 mg/l	Early boot

Mode of action- Cause abnormality in meiosis in anther

- **Gibberllic acid-**

Crop- Maize, barley, wheat, rice and sunflower

Time of application- 1 to 3 days before the onset of meiosis in anther

Mode of action- Effect nutrient flow to anther

- **LY195259-**

Crop- Wheat

Doze- 1.12 kg ai/ha

Time of application- At the stage when spike in the main shoot is 5mm long

Mode of action- Prevent anther development

- **RH0007 (hybrix)-**

Crop- Wheat

Doze- 0.2 kg/h for spring wheat

2 kg/h for winter wheat

Time of application- Before microsporogenesis

Mode of action- Disrupts pollen development and pollen abortion.

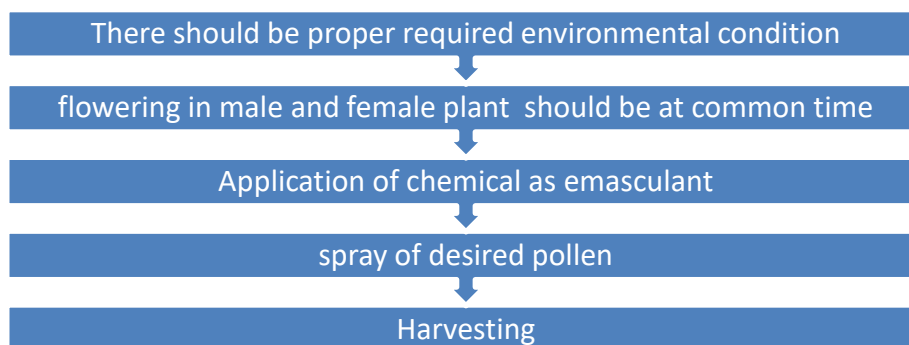
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Crop- Wheat, barley, maize and oats.

Doze- 1 to 1.2 kg/h.

Time of application- Early boot to boot stage

**Hybrid seed production based on chemical hybridising agent-**



**Advantage of chemical hybridising agent-**

- Any line can be used as female parent.
- No need of restorer line.
- Can be used in any crop.
- The hybrid seed production based on only two line breeding system
- Easy to use
- Quick action
- Highly efficient
- Less time consuming

**CONCLUSION**

If we leave some drawback than we conclude that really chemical induced male sterility is

boon for modern plant breeders. This can helpful in producing hybrids even in the crop like wheat where hybrid seed production by normal breeding approach is a tough task. Only thing that should be keep in mind application should be as recommended, with great care, at recommended time and in appropriate quantity. It should be used by experts or under the supervision of experts.

**REFERENCES**

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