

Potentiality of Botanical Herbicides in India

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SUMMARY

The bioherbicide approach to weed management involves the release of high number of selected microorganisms for attacking specific weed and controlling the weed infestation within the same year of application. Ideally, bioherbicides are most effective for weed management in annual cropping system. This article evolving the basic information about the bioherbicide.

INTRODUCTION

Herbicides are synthetic chemicals used to kill or suppress unwanted vegetation. Herbicide has revolutionized the weed control methodology since 1940s. In fact, for the first time in 1880s, herbicidal action of the compounds, for examples, common salt (NaCl), other inorganic salts of K and Mg, ash and factory waste were highlighted. Nowadays weed populations also can be control by using some botanicals. Botanical herbicide means collection of chemical compounds or alkaloid from plant leaf, root or whole plant which is effectively control the weed population. Plants offer an excellent source of biologically active natural products and have enormous potential to inspire and influence modern agrochemicals research.

Interaction of Herbicides with the Environment:

It is found that synthetic herbicides have been detected in groundwater in some areas of the country. Excessive application of herbicide including could cause the herbicides to runoff or seep into water supplies and contaminate them. It is assumed that different formulation of 2,4-D can be highly toxic to fish. Heavy treatment of soil with herbicides including pesticides can cause population of beneficial soil microorganism to decline. Due to excessive use of chemical herbicides also give bad effect on soil and food web system.

List of Potential Botanical Herbicides:

- Jangli Dhan
- Cocklebur
- Takbhindi
- Jui Phool
- Wild carrot or Gajar grass
- Akanda
- Bamboo
- Segun
- Mutha gash
- Wild radish

Mode of Action of Botanical Herbicides:

Botanicals are having Phenol which is very weak acid but is sufficiently acidic as it has recognisably acidic properties particularly in moist soil. A Hydrogen ion can break away from the -OH group and transfer to base. The position of equilibrium lies well to the left. Phenol can lose a hydrogen ion because the phenoxide ion (and Hydroxonium ion) formed is stabilized to same extent. The negative charge on the Oxygen atom is delocalised around the ring through resonance action. The more stable ion is the more likely it is to form. One of the lone pairs on the oxygen atom overlaps with delocalised electrons on the benzene ring. Formation of stable phenoxide ion triggers its acidic nature which attacks the long chain and causes AC Ease inhibition.

Effect of Different Botanicals Herbicides on Weed Management in Various Crops:

Ageratum conyzoides extract 5% (W/V) recorded lowest sedge and broadleaf weed population and highest weed control efficiency, while lowest grassy weed population was observed under Ocimum sanctum extract 5% (W/V)

Eucalyptus leaf extract attributed 11.2% higher seed yield over WC besides two HW and pendimethalin. During 2010-11 in experiment on SRI rice, the grain yield was 6.35t/ha in HW, 5.35t/ha in CC, 5.16t/ha in Tectona methanol extract while 3.44t/ha in WC. In another experiment during 2010-11 on sesame, green and black gram, the botanical extract of *Ageratum conyzoides* recorded higher growth and yield in sesame and blackgram while *Ocimum sanctum* extract among the botanicals in green gram exhibited higher harvest index, oil content and also soil nutrient status (Ghosh et.al.,2015).

Advantages of Botanicals Herbicides:

- The rapid degradation of the active product, reduces the risk of residues on food.
- Some of these products may be used shortly before harvesting of the crop.
- Most of these compounds are not phytotoxic
- Those plants have efficiency to weed populations they are easily available.
- Resistance to these compounds is not developed as quickly as with synthetic herbicides.
- Draw Back of Botanicals Herbicides:
- Most of these products are not truly herbicides since many are merely kill the weed and their effect is slow.
- Short time residual action due to rapidly degraded by UV light.
- They are not necessarily available season long.
- Maximum time kills grassy weed and less effective against hardy weeds.

REFERENCES

- R.K. Ghosh, D. Shamurailatpam, A. Ghosh, S. Sentharagi, A. Labar, D. Nongmaithem, P.K. Jana, S. Ghosh and R.K. Kole. 2015 use of botanicals herbicides in system intensification. *Indian Journal of Weed Science* 47(4):401-407