



Indian Farmer
Volume 9, Issue 11, 2022, Pp. 501-505.
Available online at: www.indianfarmer.net
ISSN: 2394-1227 (Online)

ORIGINAL PAPER



Mostly used Botanicals pesticides for Pest Control in Vegetable crops

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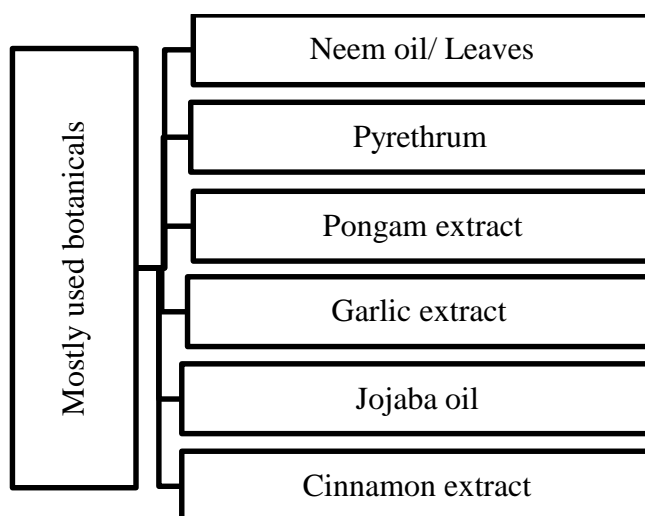
Article Received: 04 November 2022

Published Date: 08 November 2022

INTRODUCTION

Botanicals are kind of plants or plant parts which are obtained by extraction or raw from plants, used to control Pest population in vegetables cultivation, they are non-toxic as compared to other harmful chemical application. In botany we have already studied that 2ndry Plant metabolites synthesis by plants act as a protection for them from pests. Plant botanicals are also obtained from these 2ndry metabolites syntheses by plants for protection which are toxic to insects. These plant botanicals can be known as botanical pesticides, plant pesticides or simply botanicals. Simply treatments which can be used to control pest and insect are obtained by extraction from different plants or plant parts. Using plant botanicals not just improve the pest management in vegetables, but also help in maintaining physical, chemical and sensory attributes of vegetable crops providing attractive price for crop at markets. Plant botanicals have great interest of researchers worldwide to control pest population, because they are cheap and most important free from carcinogenic properties of chemicals. Some of famous botanicals used worldwide are Ecogold, Alata soap, exotic garlic, neem oil, papaya leaves and wood ash in major vegetable crops like okra and eggplant (Mochiah et al., 2011). Every botanical pesticide have its own mode of action on plants, these are kind of natural products which can kill bacteria, fungi, nematodes, viruses and insect pests but not harmful to beneficial insects. Most important they contribute to safer environment, less toxic and save the cost of expensive chemicals.

Mostly used Botanical Pesticides in vegetable crop production



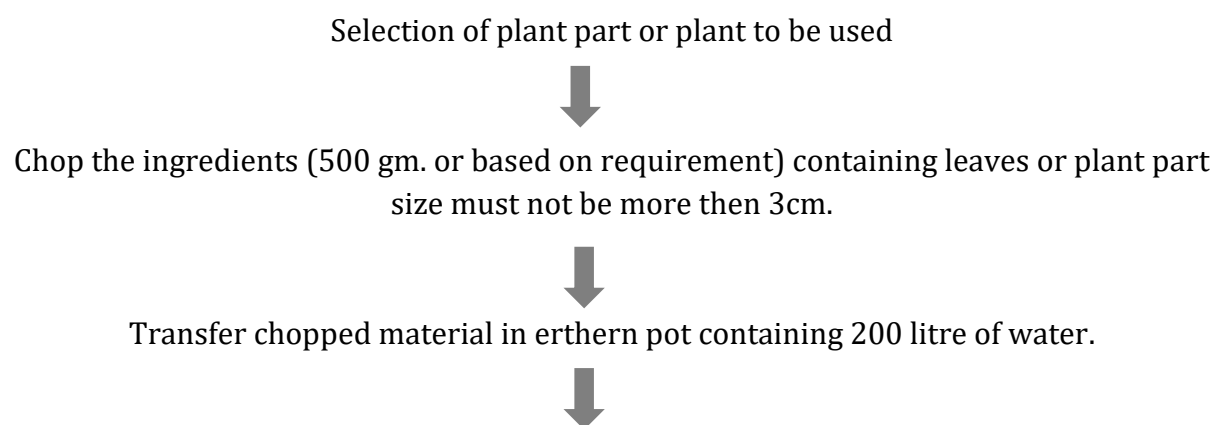
MATERIALS AND METHODOLOGIES

For Garlic extract - Takings nearby one clove of garlic and one medium-sized onion and supplement some water to them. Let it stay for a while beforehand, followed by adding a teaspoon of cayenne pepper and a dash of liquid soap to the mix

For Neem - gathering of ripe seeds, drying, roasting, crushing and pressing them to excerpt the neem oil. In the another step, the oil is then expressed into a pesticide by tempering it to the desired volume using water

For Pyrethrum- Coarsely grind the dried flower heads and to every firmly packed half-cup of flowers, add 1L of warm water. Cover and leave to stand for three hours, strain and enhance a teaspoon of pure soap and one of cooking oil. Jiggle well before spray; don't spray in high temperature such as over 32°C

(Fig 1) General steps in making botanical pesticides



Add 40-50 litre of animal urine (cow urine for best result), Tidy the earthen pot tightly followed by leaving it for 30 days for fermentation. Note – stir solution daily for 10-15 minutes.



For using it after completion of fermentation, take 15 -20 litre of water and mix it in 1-1-5 litre of botanical solution you have made followed by adding 5-6 g of detergent, must mix well before spraying.



You can spray botanical twice / week, always sure to wet leaves of crops downside mostly, because many pests present on under leaves.



Organic pesticides can be used in all vegetable crops.



It does not mean that you don't need protection while spraying botanical pesticides, always follow safety measure same as for inorganic chemical spraying such as gloves, protecting suite and eye wear for eyes protection.

(Table 1 Different botanical pesticide used in different vegetable crops to minimize Following pest in recent literatures in Pest Management Research Field

Botanical used	Amount	Beneficial crop	Target	Reference
Neem Seed	5kg/ 30%	Brinjal /Okra	Whitefly, jassid ,Thrips / Aphids	(Kunbhar <i>et al.</i> , 2018; (Uzair <i>et al.</i> , 2018)
Garlic extract	30 %	Cucumber	Root-Knot nematode	(Mahmood, S. H. 2020).
Chrysanthemum Dry flower	500 g	Cabbage	Aphids	(Jababu and Pokluda, 2017).

Some of Effective Botanical Pesticides which can be used in vegetable cultivation



(A Neem Leaves Extract :



(B Garlic Extract:



(C Jojoba Oil:

These 3 botanicals are widely used botanicals which are easily available also, even Type (A And B) in Pictures can be made by farmers by themselves on their farms in 6 Steps as mention in (Fig 1) to control Aphids, Jassids, White fly and Root Knot Nematodes etc. in Vegetable Cultivation

CONCLUSION

Chemical pesticides are harmful and also expensive; most of farmers can't afford it. Botanical pesticides are easy to make and also can be made by simple and easy steps on farm itself. Botanical pesticides would be new light which favors nontoxic, economical and environment friendly pesticides alternative, against harmful pesticides used in vegetable production.

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