

Efficacy of an Organic Formulation: Egg Lime Extract on Cluster Beans Affected by TNV (Tobacco Necrotic Virus) and Efficacy on Sprouts of Green Gram

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ABSTRACT

Tobacco Necrotic Virus (TNV) is a plant disease affecting most of the legumes. Abnormal colouring or necrotic tissue in the leaves are the primary symptoms. Currently only chemical control of the virus is possible. There are, however, cultural management options to reduce the risk of the virus. The 'ABC' of TNV is (A) refers to dark brown raised patches, (B) dark sunken lesions (C) light brown cracked patches. Egg lime formulation is a plant tonic made with egg yolk along with lime juice with an acidic pH. Serial dilutions of the Tonic ranging from 1, 10, 100 to 1000 µl were applied to the host plant *Cyamopsis tetragonoloba* (Cluster Bean). The promising levels being 10 µl egg lime formulation as a liquid foliar spray. The green gram sprouts were also subjected to egg lime formulation and results demonstrated that, at a concentration of 100 µl showed promising effects, comparable to the commonly used Bordeaux mixture 10%. Furthermore, the organic spray also exhibited potential as a soil restorative agent, offering a sustainable alternative to chemical fertilizers. Egg lime formulations are not prevalent in India but states of Tamil Nadu and Andhra Pradesh make use of this for certain pulses and other vegetable crops. Controls disease and enhances seed growth hence a promising organic fertilizer.

Keywords: Antiviral, Cluster Bean, Cyamopsis, Egg Tonic, Green Gram, Chemical Spray, Sprouts

Introduction

Medicinal plants are applied in the treatment of various plant diseases in India. The concepts of organic agriculture were developed in the early 1900s by Sir Albert Howard, F.H. King and Rudolf Steiner who believed that the use of animal manures (often made into compost), cover crops, crop rotation, and biologically based pest controls resulted in a better farming system.

Howard, having worked in India as an agricultural researcher, gained much inspiration from the traditional and sustainable farming practices he encountered there and advocated for their adoption in the West [1].

Cyamopsis tetragonoloba, guar is affected by this Tobacco Necrotic Virus (TNV) throughout the year and can be only controlled by chemical agents which is not prescribed as it is a commonly used legume a treat in all Indian dishes [2]. The characteristic feature of TNV is that it has a high level of resistance to heat and some chemical agents as well as to degradation due to aging. TNV is also unusual in that it can be spread via a fungus (*Olpidium brassicae*) [3]. Most of the potent medicinal plants have relatively no toxic or adverse effects when used by humans, to control some phytopathogens. These calls for caution in the use of medicinal plants of which the use is presently on the increase due to easy availability, affordability, accessibility, and promising efficacy comparable to other sources from Fishes.

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Egg lime formulations are not prevalent in India but states of Tamil Nadu and Andhra Pradesh make use of this for certain pulses and other vegetable crops.

Sprouts of green gram (*Phaseolus radiatus*) an interesting and nutritious food. They have been used by the Chinese for centuries, and they are now widely accepted in our diet. The possibilities of enhancing their nutritional qualities through plant breeding are great [4].

The study explored the efficacy of Egg lime formulation an organic preparation derived from egg and lemon juice a solution in which the seeds were soaked. The results demonstrated that Egg lime, at a concentration of 100 μ L showed promising effects, comparable to the commonly used Bordeaux mixture 10%. Furthermore, the organic spray also exhibited potential as a soil restorative agent, offering a sustainable alternative to chemical fertilizers. These findings highlight the importance of exploring organic solutions in agriculture and point towards the potential of organic fertilizer in improving tea plant health and yield while reducing the reliance on chemical controls [5].

Materials and Method

Method of Preparation: Egg Lime Formulation

- Cut the Lime and extract the juice into a glass container
- Dissolve the Jaggery and mix it with the Lime Juice to form a solution.
- Place the eggs as it is into the bottom of the container and ensure that the eggs are not floating.
- Close air tight lid and place it in a shaded place for 10 days.
- On the 10th day, the eggs along with the shells inside the solution would have become rubbery, like a rubber ball. Mix the eggs along with the shell well in the lime and jaggery solution.
- The solution is ready to be used can be stored for 6 months period.

- Dilute 15 ml of Egg Lime Formulation to be diluted with 1 Liter of Water before applying.
- The manure can be applied as a foliar spray
- The solution of manure can be mixed with irrigation water, either through drip irrigation or flow irrigation.
- Applied in the early mornings for promising results

S.No.	Ingredient Name	Quantity
1	Lime	20 numbers
2	Jaggery	250 Grams
3	Egg (Chicken or Duck)	10 numbers

Experimental Plant Cyamopsis Tetragonoloba

Leguminous plant valuable in a crop rotation cycle, as it lives in symbiosis with nitrogen-fixing bacteria, Commonly called as Guar applied as a gelling agent (guar gum) in its seeds utilised in an hydraulic fracturing -oil shale gas, about 80% of world production occurs in India [6]. *Cyamopsis tetragonoloba* grows upright, reaching a maximum height of up to 2–3 m. A main stem with fine branching, roots develop nodules with nitrogen-fixing soil bacteria, leaves hairy, elongated oval shape alternate phyllotaxy. Clusters of flowers grow in the plant axil and are white to bluish in color. The pods are flat and slim containing 5 to 12 small oval seeds, mature seeds are white or gray, but with excess moisture they can turn black and lose germination capacity [7,8].

Results and Discussion

The Foliar spray of egg lime formulation at time intervals of 24 hours and 48 hours showed effective results. The results are shown in Table-1. The data obtained confirmed the manurial potential of Egg lime which could restore the fertility of the soil deteriorated by chemical fertilizers.

Table 1: Efficacy of Egg Lime Formulation on Cluster Bean Plant

Serial Number	Name of the Disease	CONCENTRATION OF THE FOLIAR SPRAY (EGG LIME RASAM) μ L	Time Interval Hours	Efficacy%
1	NECROTIC LESIONS	1	24	85
		10	24	90
		100	24	100
		1000	24	100
		1	48	65
		10	48	80
		100	48	100
		1000	48	100

The study explored the efficacy of Egg lime, an organic preparation derived from egg, lime and jaggery solution in which the seeds/sprouts were soaked. The results demonstrated that Egg lime, at a concentration of 100 μ L showed promising effects, comparable to the commonly used Bordeaux mixture 10%, as a positive control. Furthermore, the organic spray also exhibited potential as a soil restorative agent, offering a sustainable alternative to chemical fertilizers. These findings highlight the importance of exploring organic solutions in agriculture and point towards the potential of organic fertilizers in improving tea plant health and yield while reducing the reliance on chemical controls.

Table 2: Effect Of Egg Lime Formulation on Sprouting and Shoot Length of Green Gram

Serial Number	Concentrations of Egg lime formulation μ l	Sprouting percentage %		Average Sprout length cm		Bordeaux 10%on Average Sprouting percentage		Bordeaux 10%on Average Sprout length cm	
		3days	6days	3days	6days	3days	6days	3days	6days
1	2	55	66	4.02	17.02	50	69	5.5	18.2
2	5	75	85	6.50	19.33	72	88	5.8	18.8
3	10	91	89	10.00	19.55	72	88	5.8	19.1
4	15	91	90	10.20	19.79	82	91	5.9	19.5
5	20	92	100	10.50	20.01	85	98	5.9	19.8
6	25	96	100	10.75	20.08	85	99	6.0	19.9

**Figure 1: Cluster Bean Plant with Fruits**

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