Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(1): 1896-1898
Received: 04-11-2018
Accepted: 08-12-2018

Mukesh Kumar Prajapati
Department of Plant Pathology
Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad,
Uttar Pradesh, India

Sobita Simon
Department of Plant Pathology
Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad,
Uttar Pradesh, India

Mohammad Faisal
Department of Plant Pathology
Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad,
Uttar Pradesh, India

Correspondence
Mukesh Kumar Prajapati
Department of Plant Pathology
Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad,
Uttar Pradesh, India

Efficacy of organic amendments against the purple blotch of garlic (*Alternaria porri*)

Mukesh Kumar Prajapati, Sobita Simon and Mohammad Faisal

Abstract
The present study was conducted at central research farm of Sam Higginbottom University of Agriculture, Technology and Sciences. Allahabad during Rabi season 2016 to 2017. The data presented, the response of different organic manures sprayed against *Alternaria porri* of garlic where improved growth of garlic at 40 days after sowing was observed. Among all the treatments the maximum plant height was recorded in T_2 Poultry manure (39.53cm), followed by T_4 Neem cake (36.50 cm), T_3 Goat manure (33.67 cm), T_1 Farmyard manure (32.87cm), T_5 Vermi compost (32.10 cm), while it was lowest in T_0 (control - 25.97 cm). The different organic manures against purple blotch disease were improved growth of garlic at 70 days after sowing. Perusal of the data indicated that all the treatments significantly increased plant height of garlic. In T_2 Poultry manure (54.57cm), followed by T_4 Neem cake (53.87cm), T_3 Goat manure (53.80), T_1 Farmyard manure (51.97cm), T_5 Vermi compost (51.60cm), as compared with T_0 Control (43.20cm). Data revealed that at 90 days after sowing all the organic manures treatments significantly increased the plant height as comparison with control. The highest plant height was recorded in T_2 Poultry manure (58.13cm), followed by T_4 Neem cake (55.93cm), T_3 Goat manure (55.40cm), T_1 Farmyard manure (55.13cm), T_5 Vermi compost (51.71cm).

Keywords: Garlic, *Alternaria porri*, organic manures, disease

Introduction
Allium sativum L., commonly known as garlic, is a species of the genus Allium and family Amarllidaceae along with garlic, shallot and chives. It is the second most widely used Allium next to onion (Rubatzky and Yamaguchi 1997) [8]. Its folk medicinal use includes treatment of whooping cough, lung diseases, stomach complaints (as healing of ulcers of the intestines) and disorders resulting from child birth and as a specific for colds, sore eyes and ear-ache (Kostalova 1982) [5]. Garlic is native to Southern Europe and Western Asia (Etoh and Simon, 2002) [3]; it is an ancient crop highly valued for seasoning foods. It is used as spice or condiment in the preparation of soup pickle and other preservatives. There is evidence that it has been in use in China and India for more than 5000 years, and in Egypt for over 4000 years (Kamenetsky and Rabinowitch 2001) [4]. It is an erect biennial plant with up to 60 cm height. The bulbs have a flattened conical stem from which several cloves (10-16) or individual sections consisting of thickened storage leaves and a growing point arise. The leaves are flat, solid and whenever formed, the flowers are pink (Rice *et al.*, 1990) [7]. Garlic is generally propagated vegetatively by cloves; the small central cloves are not usually used because they produce small plants and, therefore, small bulbs (Purseglove 1975 and Rubatzky and Yamaguchi 1997) [6, 8].

In India, Garlic (*Allium sativum* L.) is one of the important bulb crops grown and used as a spice or condiment. It is also an important foreign exchange earner for India. It is cultivated in Madras, Andhra Pradesh, Uttar Pradesh, Gujarat (Rajkot division) and Maharashtra. India is the second major producing country of garlic having 2.01 lakh ha. Area, 1058 lakh mt production and 5.27 t/ha productivity next after China. India exported 22665.99 mt. garlic amounting Rs. 3957.75 lakh during 2012-13 (Anonmous, 2014) [1].

Purple blotch of onion and garlic may be caused by several *Alternaria porri* species. Symptoms in the field include clove decay after planting and wilted, yellowed, or stunted seedlings. Infected plants are weak and stands are poor. Other species of *Alternaria porri* causes Purple Blotch on Garlic and may be prevalent on fresh garlic. This fungi attack a wide range of fruits, vegetables, bulbs, and seeds; they are common in the soil growing on infected animal and plant debris. Symptoms of the disease start as pale blemishes, yellow lesions, and soft spots. When bulbs are cut open, one or more of the fleshy scales may be discolored and water-soaked. In advanced stages, bulbs may deteriorate into complete decay. In garlic, the pathogens survive in infected cloves. (Dicklow, 2013) [2].

Materials and Methods

The present study was conducted under *in-vitro*, pot and field condition at Central field and Departmental field of Plant pathology, Sam Higginbottom University of Agriculture, Technology and Sciences, during the Rabi season of 2016-17. Field experiment was laid-out in Randomized block design with three replications.

Observations on *Alternaria porri* disease intensity were recorded on randomly selected plants from the diseased infected bulbs. The blue mold disease was graded on the basis of disease intensity observed on cloves by applying 0-9 disease rating scale developed by (Singh 2001).

$$\% \text{ infection index} = \frac{\text{Sum of all disease ratings}}{\text{Total number of rating} \times \text{max.disease grade}} \text{ x } 100$$

Economics of treatment

Gross returns were calculated by multiplying total yield with the market price of the produce. Cost of cultivation and cost of treatment imposition was deducted from the gross returns, to find out net returns and cost benefit ratio by following formula (Reddy and Reddi 2007).

$$\text{B: C ratio} = \frac{\text{Net returns}}{\text{Cost of treatment}}$$

Where,

B: C = Benefit Cost Ratio

Results and Discussion

The results and discussion of the experiment conducted on various aspects of *Alternaria porri* decay the purple blotch of garlic caused by *Alternaria porri* with reference to *in-vivo* evaluation of organic manures. The data presented in table 1 and depicted in Table 2 reveals the response of different organic manures. The disease of garlic at harvest (120 days after germination) under field conditions. The results indicated that among all the organic treatments T_2 was found significantly reduced the disease incidence of purple blotch as compared to T_4 (Neem cake), T_3(Goat manure), T_1(farmyard manure) and T_5 (vermin compost) whereas non-significant result was found in between (T_1, T_3, T_4) and (T_5, T_1). All the organic manures treated plots significantly reduced the incidence of purple blotch decay as compared with control (untreated).

Among all the treatments the maximum number of leaves was recorded in T_2 (Poultry manure, 5.60) and T_4 (Neem cake, 5.60), followed by T_3 (Goat manure, 5.27), T_1 (Farmyard manure, 5.20), T_5 (Vermin compost, 5.00), while it was lowest in T_0 (control, 3.43).

Number of leaves at 70 days after sowing were recorded and it was noticed that Poultry manure (T_2) was found significantly increased the number of leaves from goat manure (T_3), farmyard manure (T_1) and ginger and garlic (T_5) spray. Whereas, (T_4, T_3, T_1 and T_5) and T_2 and T_4 are not significant among each other. But all the organic manures significantly increased number of leaves of garlic from control (T_0).

At 90 days after sowing the maximum leaves was found in T_2 (Poultry manure, 5.87) followed by T_4 (neem cake, 4.93) and T_3 (goat manure, 4.93), T_1 (farmyard manure, 4.87), T_5 (vermi compost, 4.64), while it was lowest in T_0 (control, 4.53). Among the treatments T_5, T_1, T_3, T_4 are not significant with each other.

Table 1: Effect of Organic Manures and on Mean Plant Height (CM) At 40, 70 &90 Days after Sowing

Treatment combinations		40DAS	70DAS	90DAS
T_0	Control	25.97	43.20	46.90
T_1	Farmyard manure	32.87	51.97	55.13
T_2	Poultry manure	39.53	54.57	58.13
T_3	Goat manure	33.67	53.80	55.40
T_4	Neem cake	36.50	53.87	55.93
T_5	Vermi compost	32.10	51.60	51.71
F- test		S	S	S
S. Ed. (±)		1.22	1.15	1.45
CD (5%)		2.72	2.57	3.23

Table 2: Economics of Treatments

Treatments	Average Yield (q/ha)	Gross Return (Rs/ha)	Increased Yield over Control (q/ha)	Value of Increased Yield over Control (Rs/ha)	Cost of Cultivation (Rs/ha)	C: B Ratio
FYM	40	400000	13.58	135800	145750	1:2.74
Poultry manure	54.16	541660	27.74	277400	145750	1:3.71
Goat manure	42.5	425000	16.08	160800	145750	1:2.91
Neem cake	44.16	441666.6	17.74	177400	145750	1:3.03
Vermi compost	26.66	266666.6	0.24	2400	145750	1:1.8
Control	26.42	264166.7	-	-	145750	1:1.46

Effect of treatments on cost: benefit ratio

The data on cost benefit ratio of garlic are furnished in table. From the field experiment the data of yield were collected from the different organic manure treated plots, Maximum yield (q/ha) of garlic was recorded in (Poultry manure, 54.16) followed by (Neem cake, 44.16), (Goat manure, 42.5), (Farmyard manure, 40) as compared with untreated (control, 26.42). When cost benefit ratio was worked out, interesting results were achieved. From the cost benefit ratio the most benefit result was obtained in Poultry manure (1:3.71) followed by Neem cake (1:3.03), Goat manure (1:2.91), Farmyard manure (1:2.74) and Vermi compost (1:1.8). However all the treatments were superior in yield of garlic and management of purple blotch of garlic?

References

1. Anonymous. NHB Database, 2013-2014.
2. Dicklow MB. Storage diseases of onion and garlic. UMass Extension-Vegetable Program, 2013.
3. Etoh T, Simon PW. Diversity, fertility and seed production of garlic. In: Rabinowitch HD. and L. Currah (Eds.). Allium crop science: Recent advances. CAB International, Wallingford, UK, 2002, 101-117.
4. Kamenetsky R, Rabinowitch HD. Floral development in bolting garlic. Sexual Reproduction. 2001; 4:235-241
5. Kostalova D. The importance of garlic and garlic preparation in therapy. Hort. Abst. 1982; 52(11):697.
6. Purseglove JW. Tropical crops. Monocotyledons. The English Language Book Society and Longman. London, 1975, 607.

7. Rice RP, Rice LW, Tindall HD. Fruits and vegetable production in warm limates. Macmillan Education Ltd. Hong Kong, 1990, 486.
8. Rubatzky VE, Yamaguchi M. World Vegetables, Principles, Production and Nutritive Values. Second edition. Chapman and Hall. International Thomson publishing, New York, 1997, 843.