J. Indian Soc. Coastal Agric. Res. 34(2): 88-90 (2016)

Short communication

Management of Koleroga of Arecanut Caused by *Phytopthora meadii* by Application of Fungicide Amended Fertilizer Briquettes

Received: 14.06.2016 Accepted: 17.11.2016

Fruit rot of arecanut (*Areca catechu* L.) caused by *Phytophthora meadii* has been reported to occur in India (Butler, 1906). Disease occurs in severe form in heavy rainfall area (Coleman, 1910). Koleroga disease is a major disease of arecanut in Konkan region of Maharashtra. This disease causes heavy losses in yield (5 to 70%) of arecanut. Spraying of Bordeaux mixture on arecanut palm is very effective against koleroga disease but it is rather difficult in arecanut gardens due to excess height of these palms. Another problem in spraying of fungicides is that there is scarcity of expert climbers on tree for spraying. The fungicidal sprays are costlier due to high labourer charges of arecanut palm climbers to overcome these problems. Dr. Balahaheb Sawant Konkan Krishi Vidyapeeth, Dapoli had given a recommendation of root feeding of fungicide, fosetyl AL (0.3%), three times at an interval of one month starting from last week of May (Anonymous, 1997). Root feeding of fungicide is very effective in reducing fruit rot in arecanut, however this method faces some limitations such as finding out of feeder roots are painful and time consuming job for farmers, hence this recommendation was not popular among the arecanut growers. Thus, field trials were conducted to find out an effective alternative methods of fungicidal application for control of fruit rot (koleroga).

Field experiments were conducted at four locations viz, Arecanut Research Station, Shriwardhan and on farmers field at Nagloli, Choul and Diveagar in endemic area at Raigad district in randomized block design with three replications and seven treatments :

T_1 – Bordeaux mixture (1%) 3 sprays from last week of May at an interval of one month;

T_2 – Root feeding the palms with fungicide fosetye AL (0.3%) in 3 doses, initiated from last week of May at an interval of one month (50ml / root, two roots/palm);

T_3 – Application of fungicide (fosetye AL : @ 0.3%) through urea suphala Briquettes, 3 times from last week of May in soil 8-10cm deep by digging holes with indigenous applicator at one meter away from trunk in soil near feeding root zone;

T_4 – Application of fungicide (fosetyl AL @ 0.3%) through Konkan Annapurna briquettes from the last week of may in soil 8-10 cm deep by digging holes with indigenous applicator at one meter away from trunk in soil near feeding root zone;

T_5 – Application of fertilizer through urea suphala briquettes in three doses at one month interval in soil 8-10 cm deep by digging holes with applicator;

T_6 – Application of fertilizer through Konkan Annapurna briquettes three doses at one month interval in soil 8-10 cm deep by digging holes with applicator;

T_7 – Control.

The fertilizers available in market were selected to prepare the briquettes amended with fungicide on weight basis. Fertilizer were applied to the arecanut crop/year as per the recommendation (150:75:150 g NPK) is given in two split doses. First half dose was applied in the month of January - February and second half dose in the month of August - September. In the present study half dose of fertilizer was applied in the form of fungicide amended briquettes. The recommended fungicide was added in fertilizer briquettes on weight basis and each briquette having a weight of 3 gm was prepared. Thus, 333 & 227 briquette through Urea – suphala briquette and Konkan Annapurna briquette were prepared as per dose of fertilizer for arecanut per palm. These 333/227 briquettes were applied/palm 3 split doses i.e. 111/76 briquettes at an interval of one month starting from week of May.

All fruit bunches/palm were tied with nylon net bags. The observation on number of fruit drop in nylon net bags were collected periodically at all the locations and observed for presence mycelial growth due to pathogen. Yield was recorded in terms of number of fruits palm^{-1} and weight of fresh fruits was calculated in kg palm^{-1}. The percent disease incidence was calculated

for all the locations and pooled analysis of data is presented in table.

The data on percent disease incidence due to Koleroga at four locations was statistically analyzed and is presented in Table 1. Treatments T_1, T_2, T_3 and T_4 included in study were statistically effective in reducing the disease incidence of Koleroga of arecanut at all locations. Among the all treatments, treatment T_3 and T_4 were found the most effective in reducing the disease. Three treatments included application of fungicide – fertilizer mixture briquette i.e. fungicide urea – suphala (T_3) or fungicide – urea – Godavari Konkan Annapurna briquette (T_4). These treatments were statistically at par with the treatment was comprising spraying of Bordeaux mixture (T_1) and root feeding of fosetyl AL (Anonymous, 2000) in reducing the disease. Application of fertilizer amended briquette through the applicator is most easy method and also labour saving.

Table 1. *Effect of different methods fungicide application on incidence of Koleroga*

Treatment	Mean percent disease incidence PDI				Pooled mean	% Reduction of disease over control.
	L_1	L_2	L_3	L_4		
T_1	10.72 (19.09)	27.10 (31.36)	12.69 (26.85)	12.69 (26.85)	15.79	54.43
T_2	5.96 (14.09)	20.14 (26.41)	13.38 (21.45)	6.04 (14.21)	11.38	67.12
T_3	5.84 (13.98)	18.52 (25.41)	11.18 (19.51)	6.22 (14.31)	10.44	69.83
T_4	5.82 (13.97)	20.51 (26.92)	11.97 (20.19)	6.04 (14.21)	11.09	66.64
T_5	13.04 (20.15)	31.34 (33.99)	23.05 (28.68)	11.34 (19.67)	19.69	43.11
T_6	14.92 (22.62)	31.96 (34.42)	25.16 (30.10)	14.21 (22.14)	21.56	37.00
T_7	23.38 (28.91)	48.99 (44.42)	34.75 (36.18)	31.33 (34.03)	34.61	–
S E	1.26	1.86	0.89	0.66	2.75	–
CD at 5%	2.75	4.05	1.93	1.43	8.30	–

L_1 – Shriwardhan. L_2 – Diveagar. L_3 – Nagloli. L_4 – Chaul, Figures in the parenthesis are transformed values

Table 2. *Effect of different methods of fungicidal application on yield of arecanut*

Treatment	Yield (kg palm^{-1})				Pooled mean	% increased over control
	L_1	L_2	L_3	L_4		
T_1	6.50	5.17	6.17	6.50	6.085	46.98
T_2	8.17	5.50	6.67	7.47	6.953	67.95
T_3	8.67	6.00	7.17	8.00	7.585	83.21
T_4	8.83	6.17	7.00	8.33	7.583	83.16
T_5	6.83	5.83	6.50	7.13	6.041	54.78
T_6	6.50	5.17	6.67	6.57	6.403	54.66
T_7	4.17	4.17	4.30	3.92	4.140	–
S E	0.77	0.53	0.23	0.96	0.264	–
CD at 5%	1.68	1.15	0.50	2.10	0.783	–

L_1 – Shriwardhan, L_2 – Diveagar, L_3 – Nagloli, L_4 – Chaul.

Table 3. *Per hectare cost and returns (Rs.) due to various treatments for control of Koleroga disease of arecanut*

Sr. No.	Treatments	Total cost	Total returns	Net returns	B.C. ratio
1	T_1	155402	250440	95038	1.61
2	T_2	159922	286170	126248	1.79
3	T_3	171508	312198	140690	1.82
4	T_4	161908	312090	150182	1.93
5	T_5	165076	263760	98684	1.60
6	T_6	158478	263520	105042	1.66
7	T_7	149282	170400	21118	1.14

The yield data of arecanut / palm of four locations was statistically analyzed and presented in Table 2. It was observed from the data that treatment T_3 and T_4 were recorded highest fruit yield *i.e.* 7.585 and 7.583 kg palm^{-1} respectively, which is significantly superior over all the treatmenst except treatment T_2 which is at par with these treatments.

Among all the treatmentsT_3 and T_4 were found to be the most effective treatments in reducing the disease which resulted in disease reduction and less fruit drop of arecanut ultimately it increases the fruit yield of arecanut which is 83.21 and 83.16 percent over the control (T_7). It is revealed from Table 3 that, T_4 application of fungicide amended briquettes (Konkan Annapurna) resulted highest net returns (Rs. 150182/ha) with B.C. ratio 1.93 followed by T_3 (application of fungicide amended briquettes Urea - suphala) and T_2 (Root feeding of 0.3 % Fosetyl AL fungicide). The additional cost and returns over control are given in Table.3. It is revealed from Table.3 that additional net returns form T_4 over control were higher (Rs. 129064 ha^{-1}) followed by T_3 (Rs. 119572 ha^{-1}) and T_2 (Rs. 105130 ha^{-1}).

Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth
Dapoli, Maharashtra - 415712
E-mail : kasturemc@gmail.com

V. S. PANDE, A. A. DADEMAL, M. C. KASTURE
and R. G. BHAGWAT

REFERENCES

Anonymous (1997). A report of plant protection subcommittee meeting.

Anonymous (2000). Annual Report of Control plantation crops Research Institute Kasargod, Kerala. pp 67-68.

Butler E. J. (1906). Some disease of plam. *Agriculture Journal Indica* **1**: 299-310.

Coleman, L. C. (1910). Diseases of areca palm 'Koleroga'. *Ann. Myc* **8**: 591- 625.