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RESEARCH ARTICLE

PREVALANCE AND MANAGEMENT OF SOME MAJOR DISEASES OF MANGO AT AFGOYE AND BAL'AD DISTRICT IN SOMALIA

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Abstract

The experiments were conducted in different mango orchards of Afgoye and Bal'ad districts in Somalia under the faculty of Agriculture, Zamzam University of Science and Technology during February to April, 2020 on prevalence and management of mango diseases. Altogether, seven different diseases viz. Anthracnose, die-back, powdery mildew, sooty mold, red rust, bacterial leaf blight and bacterial leaf spot were recorded. All the diseases were common in both regions but these varied from orchard to orchard. Among the diseases, severity of Anthracnose (35.3%), die-back (20.67%), powdery mildew (45.17%), red rust (13.75%) and bacterial leaf spot (54.33%) were found major problem in Bal'ad districts. In Afgoye, Anthracnose (16.033%), sooty mold (18.90%), bacterial leaf blight (19.833%) and bacterial leaf spot (8.927%) were found the highest severity. fungicides Carozate 45, Carbazim, respectively, were evaluated and found that Carbazim were good effect in controlling Anthracnose, sooty mold, red rust and bacterial leaf spot. Carozate 45 was also effective in controlling Anthracnose, die-back, powdery mildew, red rust 'al leaf spot disease. like similarly weused botanicals fungicide, Such as Neemand Garlic well cake. respectively, were evaluated and found that Neemand Garlic were good effect in controlling Anthracnose, sooty mold, red rust and bacterial leaf spot. Neem was also effective in controlling Anthracnose, die-back, powdery mildew, red rust 'al leaf spot disease.

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Introduction:-

Mangos belong to the genus *Mangifera* of the family *Anacardiaceae*. The genus *Mangifera* contains several species that bear edible fruit. Most of the fruit trees that are commonly known as mangos belong to the species *Mangifera indica*. The other edible *Mangifera* species generally have lower quality fruit and are commonly referred to as wild mangos. (Bally, 2006).

Mango is native to India and is one of the most important fruit crops world-wide. Its botanical name is *Mangifera indica* L. and is the most important species of the genus *Mangifera*, which produces the most delicious fruit called

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the mango. The genus *Mangifera* contains about 49 species, of which 8 are of doubtful status and 41 are valid species. Morphologically the genus could be separated under two sections based on the character of the flower disc: the first, with 34 species, has flowers with well developed swollen disc, and the second, with 7 species, has obsolete or pedicellate disc.

Mangoes are a popular, nutritional tropical fruit, which are now one of the most important fruits crops in tropical and subtropical areas of the world. They originated in India, where they have been cultivated for more than 4000 years. Beginning in the 16th Century, mangoes were gradually distributed from India to other tropical countries in Asia such as Philippines, Indonesia, China and Thailand. They were also spread to the Americas in the 18th Century, and from western Mexico they were carried to Hawaii in the early 19th century. The first recorded introduction to Florida was at Cape Sable in 1833. Mango was introduced to Egypt in the 18th Century from Ceylon by the Egyptian leader Ahmed Orabi upon his release from internment. Many cultivars grown in Egypt today, such as 'Zibdia' and 'Hindi Be-Sennara' date from this time (Ibrahim and Khalif, 1999). Increasing commercial acreage, and improved handling shipping procedures are expected to increase the global market penetration of the fruits. Currently, the major producers include India, Pakistan, Indonesia, Mexico, Brazil, and the Philippines. Other important producers are Australia, South Africa, Egypt and U.S (Crane and Campbell, 1994). (Kooten, Lo, & Harbinson, 2005)

Mangoes (Ambe in the local language of Somalia) are widely grown in Somalia, and there are many varieties, including shushuumow, dhoodhoo, boorbo, shiire, and mishaariyow. Mangoes have been grown in Eastern Somalia since at least 1331. as is the case in Somalia The change of wet and dry season is favourable to the productivity where two rainy seasons occur: Gu (April – May) and Deyr (October – December) the tree bears fruits even twice a year. The big tree can have various positive ecological functions. Its extended root system fixes the soil and prevents erosion or flood damage in addition it can serve as windbreak for other plantation crops, especially bananas. The Management Pruning of diseased malformed panicles reduce the load of primary inoculums and improve the control achieved by spraying of mildew removal and destruction of infected parts is helpful in reducing the initial disease inoculums. effect of Burgundy mixture, Perenox, Lime sulphur and Dithane M-45 on spore germination indicated that these fungicides may be profitably utilized for control of the disease in field. (Prof Mohamed Ali Abukar, 2004).

However, the occurrence and prevalence of mango diseases in different orchards are not yet studied in Afgoye and Bal'ad districts in Somalia but it is urgently needed and necessary to know the status of the disease for taking necessary steps to manage the diseases. For these reasons, mango productions are to be reared up with proper care in the orchards in order to avoid the diseases and to ensure quality mango production and increasing yield. Keeping in view of the above discussion, the present study was undertaken in Afgoye and Bal'ad districts in Somalia to know the status of diseases, effect of diseases of mango and to find out the efficacy of the treatments at some selected mango orchards.

Materials and Methods:-

The experiment was conducted in ten orchards of Afgoye and Bal'ad district in Somalia. In Afgoye district 2 orchards of farmers located between (2.27740) latitude and (45.18922) longitude and about 281m above the sea level was selected other like orchards in Bal'ad district were selected that located between (2.350) altitude and (45.383) longitude and about 82m above the sea level the orchards selected were many varieties of mango plants with different ages. The present investigation was done in different mango orchards. Disease of mango on inflorescence and fruit not considered for the study as because the mango has alternate bearing habit. Only the leaves and twigs disease were taken consideration by observing their symptoms and sign. Intercultural operations were done by the orchard owner as a regular and routine work. Irrigation of the plants was also done by them as a routine work during study period. Any other treatments were not applied during the study period without selected treatments.

Selection of orchard in Afgoye and Bal'ad

Mango orchard was selected with the help of Jambalul Sub-Assistant Agriculture field. Mango orchard of farmer was selected in two different location in Afgoye and Bal'ad farmer was selected in two different locations, detailed of the locations and farmers were as follows:

Table 1:- Selection of orchard in Afgoye and Bal'ad Districts.

No. of Orchard in Afgoye	Name of the Farmer's	Location/Village	Total plants in the orchard	Plants age (years)	Selection plants (No.)
Orchard 1	Ibrahim maskax	Nakaruma	120	3_5	15
Orchard 2	Mohamed xanano	Jambalul	75	5-7	15
No. of Orchard in Bal'ad	Name of the Farmer's	Location/Village	Total plants in the orchard	Plants age (years)	Selection plants (No.)
Orchard 1	Mohamed xaji sikale	Degmad	150	3_5	21
Orchard 2	Husein Ali	Mukidheera	100	6-8	21

For management of mango diseases, The first Experiment were used Two different chemical of Treatment were applied as foliar spray at 30 days interval. The treatments were as follows: T1 = Control T2 = Spraying of (Caroozate 45@ 0.2% T3 = Spraying of (carbазim) 0.2%) (solution 0.2% 2g/L) (M-45 solution 0.2% 2g/L⁻¹) The second Experiment were used 2 Bio fungicide Treatment T1 = Control T2 = Spraying of Neem extract@ 2grm (20grm/100mL⁻¹) T3 = Spraying of Garlic extract@ 2grm (20grm/100mL⁻¹) were prepared accordingly for the purpose. Required amount of spray solution of caroozate M_45 and carbазim were prepared as mentioned above were sprayed on the selected plants. The test chemicals were sprayed thrice at 30 days interval. The first spray was done at 1st January 2020. Freshly prepared solution was used as spray solution. Adequate precautions were taken to avoid drift in spray materials from one plant to another. Special attention was taken to complete the coverage of the plants with the spray solution. In control treatment only fresh water was sprayed at every time of chemical spray. at every time of chemical spray.

Disease severity was assessed using the following formula of Johnston (2000):

$$\text{Percentage disease severity} = \frac{\text{Area of leaf tissue infected by disease}}{\text{Total area of leaf}} \times 100$$

Branches of selected mango plants were carefully observed and symptoms of the diseases were recorded following the description of Pathak (1980), Peterson (1986) Singh (1998) and Ploez et al. (1994). Observation of disease was done four times Starting from October, 2019 and ending at April, 2020. Only the major diseases of mango on leaves and twigs were considered.

The Data were recorded on the parameters: Severity of anthracnose, die-back, powdery mildew, sooty mold, red rust, and bacterial leaf blight diseases. Data on Weather and climate were recorded during the experimental period.

Data on different parameters were analyzed through computer software MSTAT-C (Anonymous 1989). Duncan's Multiple Range Test (DMRT) and least significant difference (LSD) test were performed to determine the level of significant differences and to separate the means within the parameter.

Results:-

Seven different diseases viz. anthracnose, die-back, powdery mildew, sooty mold, red rust, bacterial leaf blight and bacterial leaf spot were recorded. The symptoms of different diseases as observed in the field were as follows:

Table 1:- Symptoms of different diseases observed in the field.

Name of diseases	Description of symptoms
Anthracnose Conti.....	The disease developed on all the tender parts of the plant. It was found serious especially on tender twigs, leaves and tender stems. Symptoms on leaves were small, dark brown spots, which coalesced to form irregular lesions. The centers of old lesions were dried and fallen out.
Die-back	The disease was characterized by drying of twigs and branches followed by complete defoliation, which gives the tree an appearance of scorching by fire. Die-back became evident by discoloration and darkening of the bark. Finally the twig or branch dies, shrivels and falls. In old branches, brown streaking

	of vascular tissue was found on splitting it longitudinally.
Powdery mildew	The characteristics symptoms found were the white superficial powdery fungal growth on leaves stalk and under surface of young infected leaves. Severe infection of young leaves exhibited distorted growth.
Sooty mold	The disease in the field is recognized by the presence of a black sooty mold on the leaf surface. In severe cases, the trees turn completely black due to the presence of mold over the entire surface of twigs and leaves.
Red rust	Initially the spots were found circular greenish grey in color and velvety in texture. Later they turned reddish-brown in color with bristle like structures which gave the characteristic red rust appearance.
Bacterial leaf blight	The symptoms of the disease are characterized by a rapid enlargement of necrotic lesions in buds and leaves. Disease symptoms comprise necrosis of vegetative and flower buds and bud failure before bud break. Necrotic lesions in buds occasionally outspread to the leaf petiole through the stem. Generally, a white creamy gum exudes from necrotic lesions on buds, stems, and less frequently on petioles. Lesions on leaves start as interveinal, angular, water-soaked spots (1 to 3 mm in diameter) that coalesced, becoming dark brown to black with distinctive reddish brown margins.
Bacterial leaf spot	Groups of minute, water soaked lesions were appeared towards the tip of the leaf and surface of the leaf which turned brown to black in color, surrounded by chlorotic halo and delimited by leaf veins. Large necrotic patches were also found which is formed by coalescing of several spots.

Table 2:- Effect of location on disease severity of mango after one month of pesticide application.

Location	Anthracnosis %	Die-back %	Sooty mold %		Powdery mildew %	Red rust %	Bacterial leaf blight %	Bacterial leaf spot %
Orchard 1	16.033 a	14.00b	18.900 a		2.400b	5.200a	19.833 a	8.927 a
Orchard 2	10.233 b	16.10a	17.133b		2.567a	2.867b	17.367 b	5.667 b
CV (%)	11.09%	12.29%	5.07%		3.03%	9.83%	3.40%	3.24%

Each value is an average of 3 (three) replications. In column, values having same latter do not differ significant at P=0.05 level.

Disease severity of Anthracnose, die back, powdery mildew, sooty mold, red rust, bacterial leaf blight and bacterial leaf spot of two orchard of Afgoye were recorded after one month of pesticide application and were presented in Table 2.

The severity of Anthracnose was varied significantly according to the location of the experiment.

The highest (16.033%) severity on Anthracnose was observed in orchard 1 which was followed by orchard 2 respectively. On the other hand, the lowest (10.233%) severity of Anthracnose was observed in Orchard 2. The die back disease of mango was also varied significantly according to location. The ranges of severity were 16% to 14%. The highest severity of die back was found on orchard 2 which was followed by orchard 1 respectively. On the

contrary, the lowest die back severity was found in orchard1. The severity of powdery mildew was varied significantly according to the location of the experiment. The highest (2.567%) severity on powdery mildew e was observed in orchard 2 which was followed by orchard 1. respectively. On the other hand, the lowest (2.400%) severity of was powdery mildew observed in Orchard 1. Severity of sooty mold was observed in orchard 1.highest (18.900) severity sooty mold was observed in orchard 2. And the lowest (17.133)Incase of red rust severity was also significantly varied with location. The highest (5.200%) severity of red rust was observed in Orchard 1 and the lowest (2.867%) was in orchard 2. On the contrary, the bacterial leaf blight was found significant variation with 2 different locations. The highest (19.833 %) severity was observed in orchard 1 which was statistically similarly with orchard 2. On the other hand the lowest (17.367 %) severity of bacterial leaf blight was observed in orchard 1. Finally, the bacterial leaf spot severity was observed significant varied according to location the highest and the lowest severity ranges of bacterial leaf spot were (8.927 % to 5.667 %.) the highest was observed in orchard one and the lowest severity was observed in orchard 2.

Table 3:- Effect of treatments on disease severity of mango after one month of pesticide application.

Treatment	Anthracnosis %	Die-back %	Sooty mold %	Powdery mildew %	Red rust %	Bacterial leaf blight %	Bacterial leaf spot %
T1	14.917 a	10.667a	19.667a	3.500a	5.167a	19.750a	8.000a
T2	14.167 b	10.750a	19.250a	2.083b	4.417b	19.667a	8.000a
T3	12.583 c	10.583a	17.917b	2.750b	3.833c	18.417b	7.150b
CV (%)	11.09%	12.29%	5.07%	3.03%	9.83%	3.40%	3.24%

Each value is an average of 3 (three) replications. In column, values having same latter do not differ significant at P=0.05 level.

Disease severity of Anthracnose, die back, powdery mildew, sooty mold, red rust, bacterial leaf blight and bacterial leaf spot of two mango orchard of Afgoye in response of treatments were recorded after one month of pesticide application and were presented in Table 3.

The effect of different treatments were significant varied in Anthracnosedisease.The highest (14.917%) of disease severity was recorded in T1. T2 with was flowed by T3 and T3 respectively and the lowest (12.583%) disease severity was observed in T3. In case of die back disease, the effect of treatment were significantly varied. The highest (10.667%) disease severity was observed respectively in T1, T2, T3. and the lowest (9.25% and 9.00%) of disease severity was observed. In case of powdery mildew disease, the treatments effects varied significantly. The severity range was 3.5% to 2.08% to 2.75% 2.085% to 2.00%. The highest disease was observed in T1 to t2 and t3 repectively and The lowest was significantly found. In sooty mold disease, the treatments were significantly varied. The highest (19.67%)in T1 to T2, T3 respectively on the other hand, The lowest (16.33) was observed. Red rust was shown significantly variation in treatment effects. The highest (5.167%) disease severity was found in t1 to T2, T3 respectively while the lowest (3.25%) in which statistically similarly and found The treatment effects in bacterial leaf blight severity was significantly same. The highest severity was found (19.75%) in T1 and T2. And the lowest of treatment effect was (17.58%), in which statistically similarly and found. In case of bacterial leaf spot, the treatment effects was significantly varied. The highest 18.00% in T1 and T2 respectively on the other hand the lowest (6.4%), severity was observed.

Table 4:- Effect of location and treatments on disease severity of mango after one month of pesticide application in different orchards of Afgoye.

Location	Treatment	Anthracnosis %	Die-back %	Sooty mold %	Powdery mildew %	Red rust %	Bacterial leaf blight %	Bacterial leaf spot %
Orchard 1	T1	16.500a	14.000a	19.000a	4.333a	5.667a	20.167a	9.000a
	T2	16.333a	13.667a	18.833b	3.000b	4.833ab	20.333a	9.333a
	T3	15.883a	14.833a	18.667b	2.667c	5.500a	19.833a	8.633a
Orchard 2	T1	13.333b	7.333b	20.333a	2.667c	4.667ab	19.333a	7.000b
	T2	12.000c	7.833b	19.667a	3.167b	4.000b	19.000ab	6.667c

	T3	9.333c	6.333c	17.167c	2.833c	2.167c	17.000c	5.667d
	CV (%)	11.09%	12.29%	5.07%	3.03%	9.83%	3.40%	3.24%

Each value is an average of 3 (three) replications. In column, values having same letter do not differ significant at P=0.05 level.

Disease severity of Anthracnose, die back, powdery mildew, sooty mold, red rust, bacterial leaf blight and bacterial leaf spot of two mango orchard of Afgoye in response of location and treatments were recorded after one month of pesticide application and were presented in Table 4.

The severity of Anthracnose was varied significantly according to the location and treatment of the experiment. The highest (16.500%) severity of Anthracnose was recorded in orchard 2. with T3. and the lowest (9.333%) disease severity was recorded in orchard 2. with T3. The lowest (6.333%) die back disease was observed in orchard 2. with T3. The highest (14.833%) orchard 1. treatment and T3 respectively. The severity of sooty mold was varied significantly according to the location and treatment of the experiment. The highest (20.333%) severity of sooty mold was recorded in orchard 2 with T1 and respectively and the highest (19.667%) with orchard 2. and T2. which statically same orchard 2. and T3. the lowest (17.167%) disease severity was recorded in orchard 2 with T3. The powdery mildew significant varied with the location and treatment effects. The highest (4.333%) severity was found in orchard 1 with T1 the lowest (2.667%) was also found orchard 1 and T3 and orchard 2. with T1. In case of red rust disease significant was varied. The highest (5.667%) severity was recorded in orchard 1 with T1. and respectively and the lowest (2.167%) severity were observed in orchard 2 with T3. treatment and respectively. On the other hand the severity of bacterial leaf blight was significantly varied with different location and treatment. The highest (20.333%) severity was observed in orchard 1. and T2. which was statistically similar with treatment respectively. The lowest (17.000%) severity was found in orchard 2 with T3. which statistically are similar. Bacterial leaf spot disease severity was significant varied with location and treatment. The highest (9.333%) severity were observed orchard 1 with T2 and respectively and the lowest (5.667) in orchard 2. with T3.

Table 5:- Effect of location on disease severity of mango after one month of pesticide application.

Location	Anthracnosis %	Die-back %	Sooty mold %	Powdery mildew %	Red rust %	Bacterial leaf blight %	Bacterial leaf spot %
Orchard 1	10.786a	7.524a	12.98b	1.810a	2.500b	14.048a	5.262b
Orchard 2	10.619b	6.238b	15.19a	1.500b	2.881a	13.286b	5.500a
CV (%)	7.59	12.29	6.29	4.96	5.24	8.46	14.31

Each value is an average of 3 (three) replications. In column, values having same letter do not differ significant at P=0.05 level.

Disease severity of Anthracnose, die back, powdery mildew, sooty mold, red rust, bacterial leaf blight and bacterial leaf spot of two orchard of Bal'ad, were recorded after one month of pesticide application and were presented in Table 5.

The severity of Anthracnose was varied significantly according to the location of the experiment.

The highest (10.786%) severity on Anthracnose was observed in orchard 1 which which statistically similar. On the other hand, the lowest (10.619%) severity of Anthracnose was observed in Orchard 2. The die back disease of mango was also varied significantly according to location. The ranges of severity were 7.524% to 6.23%. The greatest severity of die back was found on orchard 1 which was followed by orchard 1 respectively. On the contrary, the lowest (6.238%) die back severity was found in orchard 2. The severity of sooty mold was varied significantly according to the location of the experiment. The highest (15.19%) severity on sooty mold was observed in orchard 2 which was followed by orchard 2 respectively. On the other hand, The lowest (12.98%) severity of was sooty mold observed in Orchard 1. Severity of powdery mildew was found in orchard 1 high (1.8100%) which in lowest (1.500%). In case of red rust severity was also significantly varied with location. The highest (2.881%) severity of red rust was observed in Orchard 2 and the lowest (2.500%) was in orchard 1, and the lowest (2.500%) was observed in orchard 1. On the contrary, the bacterial leaf blight was found significant variation with 2 different

orchard. The maximum (14.048%) severity was observed in orchard 1 which was statistically similarly with orchard 1. On the other hand the lowest (13.286%) severity of bacterial leaf blight was observed in orchard 2. Finally, the bacterial leaf spot severity was observed significant varied according to location .the greatest and the smallest severity ranges of bacterial leaf spot were (5.500%) to 5.262%. the maximum was found in orchard 2 and the minimum severity was observed in orchard 1.

Table 6:- Effect of treatments on disease severity of mango after one month of pesticide application.

Treatment	Anthraco- sis %	Die-back %	Sooty mold %	Powdery mildew %	Red rust %	Bacterial leaf blight %	Bacterial leaf spot %
T1	12.667a	10.333a	17.667a	3.000a	4.583a	18.333a	8.167a
T2	12.583b	8.250b	15.667b	2.000b	3.250b	15.917b	7.083b
T3	10.750d	6.917c	15.000c	1.500d	2.833c	14.500c	5.917c
T4	11.000c	6.583d	13.750d	1.833c	2.583d	13.417d	5.083d
CV (%)	7.59	12.29	6.29	4.96	5.24	8.46	14.31

Each value is an average of 3 (three) replications. in column, values having same latter do not differ significant at P=0.05 level.

Disease severity of Anthracnose, die back, powdery mildew, sooty mold, red rust, bacterial leaf blight and bacterial leaf spot of Two mango orchard of Bal'ad in response of treatments were recorded after one month of pesticide application and were presented in Table 6.

The effect of seven (4) different treatments were significant varied in Anthracnose disease. The highest (12.667%) of disease severity was recorded in T1. T2 with was followed by T3. respectively and the In case of die back disease, the effect of treatment were significantly varied. The maximum (10.333%) disease severity was observed T1, T2, T3. and the lowest (5.586%) and (4.417%) of disease severity was observed. In case of sooty mold disease, the treatments effects varied significantly. The severity range was 17.667%, 9 and 15.667%, 15.000%, 13.750%, 13.00%, 12.167%, 11.133% The highest treatments effected by the disease was observed in T1 to T2 and T3 and T4, respectively and The lowest was significantly found in the lowest (11.333%) severity disease was observed.

In powdery mildew, the treatments were significantly varied. The highest (3.000%) in T1 to T2, T3 respectively on the other hand, The lowest (1.000%) was observed in respectively were found. Which statistically very similar. Red rust was shown significantly variation in treatment effects. The maximum (4.583%) disease severity was found in T1 to T2, T3 respectively while the minimum (1.583%). The treatment effects in bacterial leaf blight severity was significantly same. The highest severity was observed (18.333%) in T1 and T2. And the lowest of treatment effect was (10.417%), in which statistically similarly and found In case of bacterial leaf spot, the treatment effects were significantly varied. The greatest (8.167%) in T1 and T2 respectively on the other hand the lowest (2.833%), severity was observed in.

Table 7:- Effect of location and treatments on disease severity of mango after one month of pesticide application Afgoye and Bal'ad.

Location	Treatment	Anthraco- nose's %	Die- back %	Sooty mold %	Powdery mildew %	Red rust %	Bacterial leaf blight %	Bacterial leaf spot %
Orchard 3	T1	12.667b	11.000a	16.833a	2.833a	4.333a	19.000a	7.667a
	T2	13.500a	9.667b	14.667b	2.333ab	3.167b	17.167b	7.167b
	T3	11.000d	8.000c	14.333c	2.000c	2.333d	15.333c	6.333c
	T4	11.667c	7.333d	12.667d	1.833d	2.667c	14.000d	5.333d
Orchard 4	T1	12.667a	9.667a	18.500a	3.167a	4.833a	17.667a	8.667a
	T2	11.667b	6.833b	16.667b	1.667b	3.333b	14.667b	7.000b
	T3	10.500c	5.833c	15.667c	1.000d	3.333bc	13.667c	5.500c
	T4	10.333cd	5.833cd	14.833d	1.833c	2.500d	12.833d	4.833d
	CV (%)	7.59	12.29	6.29	4.96	5.24	8.46	14.31

Each value is an average of 3 (three) replications. In column, values having same latter do not differ significant at P=0.05 level.

Disease severity of Anthracnose, die back, powdery mildew, sooty mold, red rust, bacterial leaf blight and bacterial leaf spot of Two mango orchard of Bal'ad in response of location and treatments were recorded after one month of pesticide application and were presented in Table 7.

The severity of Anthracnose was varied significantly according to the location and treatment of the experiment. The highest (13.500%) severity of Anthracnose was recorded in orchard 3 with T2 and the lowest (10.333%) disease severity was recorded in orchard 4 T4. The severity of die back was varied significantly according to the location and treatment of the experiment. The greatest (11.000%) severity of sooty mold was recorded in orchard 3 with T1 and respectively high (16.833%) and the smallest (12.667%) with orchard 4 and T7, T6, T5, respectively. The powdery mildew significant varied with the location and treatment effects. The maximum (2.833%) severity was found in orchard 3 with T1 the minimum (1.0004%) was also found orchard 4 and T7. In case of red rust disease significant was varied. The highest (4.333%) severity was recorded in orchard 3 with T1 and the lowest (2.333%) severity was observed in orchard 3 with T3. On the other hand. The severity of bacterial leaf blight was significantly varied with same location and treatment. The highest (19.000%) severity was observed in orchard 3 which was statistically very close T2 & T3 respectively. The lowest (12.833%) severity was found in orchard 4 with T4. Bacterial leaf spot disease severity was significant varied with location and treatment. The highest (8.667%) severity were observed orchard 4 with T1 and T2 and orchard 1 with T1, T2, T3, which statistically respectively and the lowest (4.833) in orchard 4 with T4.

Conclusion:-

An investigation was undertaken to find out the status of major diseases of mango and their management in the faculty of Agriculture, Zamzam University of science and Technology, during February, 2020 to April, 2020. The mango orchard was selected for the study in Afgoye and Bal'ad district. The occurrence, severity and management of diseases were assessed at different locations with control measures in different orchards of mango plants. Disease status was investigated under natural epiphytic conditions throughout the experimental period.

The Management of foliar diseases of mango is neglected most of the times. As a result, most of the orchards in the country are in serious problem for the production of healthy fruits"

Therefore, the suitable management practices for controlling disease of mango leaves by applying

Two chemical treatment and 3 botanical fungicide treatments viz. T2: Spraying of Carozate-45@ and Mancozeb and Three botanical fungicides include, Neem, Garlic, Neem+Garlic and there control with T1. all seven different diseases viz. Anthracnose, die-back, powdery mildew, sooty mold, red rust, bacterial leaf blight and bacterial leaf spot were recorded during the experimental period. Among the diseases, Anthracnose, die-back, powdery mildew, red rust and bacterial leaf blight diseases were found major problem in Bal'ad district, where sooty mold and bacterial leaf spot were minor problems. On the other hand, sooty mold, bacterial leaf spot, red rust, Anthracnose and powdery mildew were found major problems in Afgoye district where Anthracnose, die-back and bacterial leaf blight were minor problems. Disease severity was influenced by different locations and which may be incorporated by weather factor, fertilizer management, different cultural management practices etc. Efficacy of fungicide (Carozate-45) and (mancozeb) and other affective botanical such as neem, garlic well cake were evaluated in different orchards of Afgoye and Bal'ad district. Neem was found good in controlling die-back, powdery mildew, red rust and bacterial leaf blight. T4: Spraying of Neem + Garlic@ 2grm well care was found effective in controlling Anthracnose, die-back, sooty mold, and red rust and bacterial leaf spot. However, the findings of the present study pointed out that all of these seven diseases were common in Afgoye and Bal'ad district in Somalia. But the disease severity was higher in orchard of Bal'ad than that of Afgoye except sooty mold and bacterial leaf spot. The growers may be suggested to manage the diseases by spraying CarozateM-45, Mancozeb, and also Botanical fungicide such, Neem, garlic well cake.

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