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Short Communication

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Validation and Demonstration of Dimethoate 40% EC Insecticide for Management of White Mango Scale (*Aulacaspis tubercularis*) in Selected Districts of Central Ethiopia Region

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A B S T R A C T

Mango is important food and cash crops in Ethiopia. However, the production and productivity of this crop is highly limited by high White Mango Scale (WMS) infestations. Controlling of WMS is very important to increase mango fruit yield. Therefore, the objective this study was to validate and demonstrate Dimethoate 40% EC for management of WMS. The study was carried out in Siltie zone (Sankura district) and Halaba zone (Wera district) during 2025 cropping season. Two treatments Dimethoate 40% EC and Control was used. Four farmers from each district were used. The data on mean Severity (%) and mean numbers of clusters white mango scale were taken three times monthly interval. The collected data were computed by using Microsoft excel 2010 and presented in tables. The higher severity (66.75% and 69.25%) and the lower (3.75% and 4.75%) were recorded from Wera and Sankura disticts, respectively. Dimethoate 40% EC is a highly effective systemic insecticide for managing white mango scale particularly when integrated with cultural practices like pruning. Therefore, applying it two times as foliar spray in monthly interval especially during peak infestation periods is very important.

INTRODUCTION

Mango production is a vital source of income and nutrition. In the past years its production was limited in some parts of Ethiopia and produced mainly at small scale farms primarily for family consumption and local fresh fruit markets. In recent years, however, there has been a significant shift toward expanding the sector in terms of area coverage and production volume due to growing demand from industrial processing factories and increased domestic consumption. Its production and productivity is constrained by different biotic and a biotic factors even if it is very important crop in the country. Among biotic factors white mango scale (WMS) (*Aulacaspis tubercularis*) is the most mango crop affecting insect pest in the country. Since 2010 it was identified for the first time in Ethiopia (Fita, 2014; Ayalew *et al.*, 2015).

Mango White Scale causes severe damage to mangoes around the world. It feeds on sap, causing yellowing/defoliation, pink blemishes, fruit spoilage, and severe dieback (Abo-Shanab, 2012). It causes deformations, defoliation, drying up of young twigs, dieback, poor blossoming, and death of twigs by the action of toxic saliva. It sucks plant sap and causing: reduced photosynthesis, poor fruit quality, yield losses and economic impact. At high levels of infestation, it causes up to 100% yield losses if not controlled in time. The pest can attack crops such as fruits (citrus, papaya, avocado), spices (ginger, cinnamon) and pumpkin (Mohammed *et al.*, 2012)

Different mango growing countries employ a combination of cultural, biological, and chemical methods to manage WMS. Common control measures taken against the WMS include use of chemical insecticides, cultural practices and biological control using parasitoids and predators (Abo-Shanab, 2012;

Gashawbeza *et al*., 2015). Even if various insecticides have been evaluated by researchers to manage WMS, it is difficult pest to control primarily due to its protective waxy, hard shell that shields it from contact insecticides. Its high reproductive rate, rapid spread by wind or infested material, and habit of hiding under leaves and dense canopies make full insecticide coverage nearly impossible. Dimethoate 40% EC is considered an effective systemic insecticide for the control of White Mango Scale. Therefore, the study was conducted to validate and demonstrate Dimethoate 40% EC for management of White Mango Scale.

MATERIALS AND METHODS

The experiment was conducted in Siltie zone (Sankura district) and Halaba zone (Wera district) during 2025. Treatments Dimethoate 40% EC and control were used. Four farmers who have 7 to 8 years old mango trees were selected for each district. One mango tree was used as a "plot "and spray was done monthly interval for two times. Time of application was April to May during high infestation. Treated mango trees were pruned before spray. In the current study the applied rate of Dimethoate 40% EC was 3.4L/ha. Data was taken three times monthly interval (Before spray, after first spray and after second spray). Mean Severity (%) and mean numbers of clusters white mango scale were counted per 10 leaves just before the initial spray. Then two records were done following the first and second spray.

Data Collection

Severity % of white mango scale before and after spray was recorded. Furthermore, number of white mango scale clusters before and after spray was recorded.

Data Analysis

Severity percentage and number of white mango scale clusters were computed by using Microsoft excel 2010 and presented in tables.

RESULT AND DISCUSSION

The higher severity (66.75%) was recorded from unsprayed mango trees while the lower severity (3.75%) was recorded from Dimethoate 40% EC treated mango trees in Wera district. Whereas the higher severity (69.25%) was recorded from unsprayed mango trees while the lower severity (4.75%) was recorded from Dimethoate 40% EC treated mango trees in Sankura district (Table 1). The resulted is in line with Asnake *et al*., 2025 who reported Dimethoate 40% EC spray along with pruning practices has been identified as the most effective integrated approach for managing WMS. The severity of WMS was increasing from initial recording to last recording in control plots while it was decreasing in treated plots (Figure 1). The number of WMS clusters was 15.25 after second spray in control plots while the treated plants were free of clusters (Table 2). The study agreed with Abera, (2023) who recorded 14.1 clusters per leaf. The survey conducted by Kumlachew Alemu *et al*., 2024 showed 15.6 clusters of WMS.

Table 1: Effect of Dimethoate on leaf severity (%) of mango tree at Wera and Sankura districts

Treatments	Severity (%) at Wera district			Severity (%) at Sankura district		
	Before spray	After first spray	After second spray	Before spray	After first spray	After second spray
Control (untreated)	55.75	63	66.75	61.25	65.5	69.25
Dimethoate 40% EC	52.5	11.25	3.75	57.5	13.75	4.75

Table 2: Effect of Dimethoate on number of white mango scale clusters at Wera and Sankura districts

Treatments	WMS clusters at Wera			WMS clusters at Sankura		
	Before spray	After first spray	After second spray	Before spray	After first spray	After second spray
Control (untreated)	12.50	13.125	14.5	12.75	13.88	15.25
Dimethoate 40% EC	11.62	0	0	13.25	0	0

Note:WMS= White Mango Scale

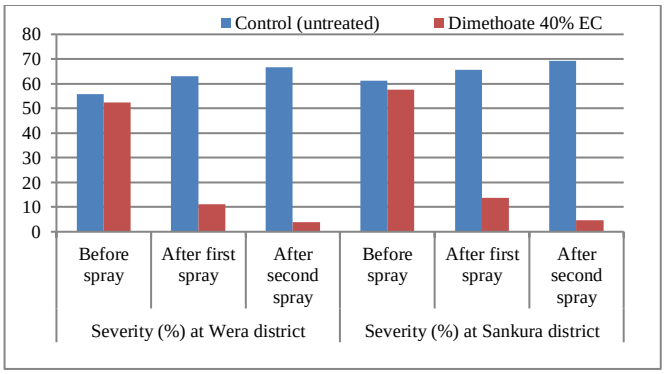

Figure 1: Severity of WMS (%) in study areas

CONCLUSION

The insecticide Dimethoate 40 E.C was evaluated for management of WMS at Wera and Sankura districts. The result of the study indicated that, Dimethoate 40% EC is a highly effective systemic insecticide for managing white mango scale particularly when integrated with cultural practices like pruning. Therefore, applying it two times as foliar spray in monthly interval especially during peak infestation periods is very important.

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CONFLICT OF INTERESTS

The authors have not declared any conflict of interests\

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