



EFFECT OF MANUFACTURED IRON OXIDES IN CONTROL OF TOMATO YELLOW LEAF CURL VIRUS (TYLCV)

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Abstract

The aim of this study was to evaluate the antiviral activity of four concentrations of iron oxides 0, 0.5, 1 and 1.5% against Tomato yellow leaf curl virus (TYLCV) -infecting tomato plants. The results of experiments showed that no significant differences in plant height and branches number among treatments, while the disease severity of TYLCV virus was decreased by using concentrations of iron oxides 0.5, 1.0, 1.5 % to 0.5, 0.3, 1.6 %, respectively, compared with control 2.8%, where concentrations 1.0% and 0.5% were significantly superior in decreasing of disease severity with no significant differences between them followed by concentration 1.5%.

Key words: TYLCV, iron oxides, *Bemisia tabaci*.

Introduction

Tomato (*Lycopersicon esculentum* Mill.) is one of the most important vegetables in the world and is second in significance after potatoes in numerous countries (Salim and Jasim, 2016). The main restrictions that effect on production of tomato are diseases caused by viruses, fungi and bacteria (Salim *et al.*, 2017, Jones *et al.*, 2016, McGovern, 2015). Tomato yellow leaf curl virus (TYLCV) is one of the most devastating viruses of cultivated tomatoes in tropical and subtropical districts. The virus is a monopartite begomovirus. the genome of the virus contains a single-stranded circular DNA and the length of the DNA is in all cases about 2800 nucleotides (Glick *et al.*, 2009). TYLCV is transmitted by the whitefly *Bemisia tabaci* in a persistent manner whose severe population outbreaks are usually associated with high incidence of the disease. Symptoms of TYLCV are appearing on infected plants that include yellowing between the veins, wrinkling of leaves, stunting, leaf margins curl upward, giving cup shape and flowers dropping occurs before fruit set (Melzer *et al.*, 2009). Control of TYLCV depends on intensive using of insecticide against vectors, but this method leads to environmental pollution and occurs insecticide-resistant, or cultivation of resistant varieties. In spite of all attempts

to reduce the infection of this virus on the tomato crop, the problem of the virus is still continue, therefore other alternative methods need to be investigated. The (TYLCV) causes huge economic losses in the production of tomatoes in Iraq, therefore it is important to search for a new approach to virus control as compared with using of insecticides against whitefly (*Bemisia tabaci*) (Jabar *et al.*, 2020). This study aimed to use some iron oxides which have been manufactured in laboratory which possess a high density of positive charge due to height of its specific surface area, which gives it the ability and effectiveness to interact with viruses in infected plants and thus lead to inhibition of effectiveness and intensity of Infection and spread of this virus under protected cultivation conditions.

Materials and methods

Preparation of plant samples

Infected tomato plants with wrinkling and yellowing symptoms were collected from Al-Kahla fields, specifically from the nursery of the Directorate of Agriculture of Misan province, then transported in plastic pots diameter 22 cm and height 25 cm and placed inside the plastic house in the fields of plant protection department, Faculty of Agriculture, University of Misan. The virus isolate (Tylcv-Bsr) was obtained from Dr. Abdulkareem Kassim

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