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THE EFFECT OF PYRETHRUM AND BACILLUS THURINGIENSIS AGAINST
THE BROWN MARMORATED STINK BUG HALYOMORPHA HALYS (STAL)
(HEMIPTERA: PANTATOMIDAE) IN GEORGIA**

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The brown marmorated stink bug (BMSB) *Halyomorpha halys* (Stål) (Hemiptera: Pentatomidae) is an invasive species that has become an important orchard pest in the all over the world. Adults and nymphs feed on tree fruit, which has more than 300 reported hosts, including important horticultural crops. *Halyomorpha halys* is a highly polyphagous pest attacking more than 100 plant species, primarily fruit trees and woody ornamentals, but also field crops. Fruit crops: *Citrus spp.*, *Diospyros spp.*, *Malus domestica* (apple), *Morus spp.* (mulberries), *Prunus armeniaca* (apricot), *P. avium* (sweet cherry), *P. domestica* (plum), *P. persica* (peach), *Pyrus communis* (pear), *Rubus idaeus* (raspberry) and *Vitis vinifera* (grapevine). Field crops: *Asparagus spp.*, *Glycine max* (soybean), *Phaseolus vulgaris* (common bean) and *Zea mays* (maize). Forest and ornamental trees/shrubs: *Abelia*, *Acer* (maples), *Aralia elata*, *Buddleia davidii*, *Cryptomeria*, *Cupressus*, *Decaisnea fargesii*, *Hibiscus*, *Lonicera*, *Paulownia tomentosa*, *Rosa rugosa*, *Salix* (willows), *Stewartia pseudocamellia*, *Tropaeolum majus* and *Actrium spp.* (weeds). *H. halys* feeds of products by absorbing their juice saps as well as posing danger in agriculture areas.

The brown marmorated stink bug *Halyomorpha halys*, native to East Asia, is an invasive species that is expanding its range in North America (first detected in 1996) and in Europe (first detected 2004). This species was recorded for the first time in Georgia in 2015 (2016) and spread very quickly. *Halyomorpha halys* has become an important pest together with *Ricana simulans* in orchards in Eastern Black Sea Region in recent years. The brown marmorated stink bug is a recent example of a serious biological invasive species, especially in Georgia and described as an occasional or outbreak pest of several crops as well as a nuisance pest in the native region. Due to serious economic losses caused by *H. halys* for world agriculture, unprecedented group efforts have been made to study the biology of *H. halys* and develop management strategies. Management tactics against this new pest are currently limited to repeated synthetic insecticide applications and using pheromone traps. However, the spread and the damage continued of *H. halys*.

The study was conducted for the purpose to determine the efficiencies of alternative biopesticides to be used in the control against *Halyomorpha halys*. The bio pesticides referred to as Pyrethrum (Spruzit Neu) and Bacillus thuringiensis (Dipel DF) were used, during the spring and summer of 2017, the period when nymphs and adults are found profoundly in the city of Batumi – Georgia. Neemazal and water were used for the control. It was that the most effective practices for nymphs and adults would be through NeemAzal®. Practices by means of pesticides in different doses were performed on the nymphs and adults of *Halyomorpha halys*, and the results were evaluated according to One-Way Variance Analysis and Duncan Test. Following the biopesticides, 5 controls were made in every 2 days, and the alive and dead individuals were counted.

The most commonly-seen efficiency rates were determined to be 72% with Neemazal in the nymph stage. The impact rate of the biopesticides were found a little low in this study. For biopesticides were determined that the most effective practices for nymphs would be through the use of 100 gr/100lt *Bacillus thuringiensis* (Dipel DF), 300 gr/100 lt Dipel DF and 500 gr/100 lt Dipel DF, whereas the most effective practices for adults would be through the use of 600ml/100 lt Pyrethrum (Spruzit Neu) and 500gr/100 lt Dipel DF. Seen efficiency rates were determined to be 38.5% with 600ml/100 lt dose of Pyrethrum and 42% with 500gr/100 lt dose of Dipel DF. The impact rate of the biopesticides performed against the adults, on the other hand, was found to be 42.3% with 600 ml/100 lt dose of Pyrethrum and 33% with 500gr/100 lt dose of Dipel DF.

As a result, in the present study, it was observed that both pesticides were not to be much effective on the nymphs and adults of *H. halys* but NeemAzal is effected for control. The nymphs of *H. halys* were influenced more by the applied biopesticides. The field research of these biopesticides must be well investigated before they are presented for active use.