

Assessment of the Effectiveness of Using Garlic, Hot Pepper and Soap Spray in Control of Green Aphids (*Brevicoryne brassicae* L.) on Kales

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Abstract

Kale production in many parts of the world is mainly faced by the challenge of pests and diseases. Aphids are a major concern because they make the kales unsightly, reduce their quality, and vector several diseases. Farmers have over the years relied on chemical sprays to successfully control these aphids. The chemicals have however led to environmental pollution. Botanical control methods can be used to replace these chemicals in an attempt to promote environmental sustainability. The effect of various combinations of garlic (*Allium vineale*), hot pepper (*Capsicum frutescens*) and soap spray on green aphid population on kales was assessed in a greenhouse at University of Embu. The experiment included eight different treatments: 1.) Hot pepper spray 2.) Garlic spray 3.) Hot pepper and garlic spray 4.) Hot pepper and soap spray 5.) Soap and garlic spray 6.) Soap, garlic and hot pepper spray 7.) Chemical spray (Thiamethoxam 250g/kg) was used as a standard check 8.) Untreated plants were used as control. The experimental layout used was the Randomized Complete Block Design (RCBD). The experiment had eight experimental rows including the control. Each row consisted of ten planting bags. The experiment was replicated thrice. Kales were planted in planting bags and aphids allowed to infest the plants for three weeks before spraying began. Spraying was done twice; first spraying was three weeks after aphids were noticed, and second spraying five days after the first spraying. Data on the number of aphids on kale plants was collected just before spraying and twenty four hours after spraying. Of the botanical sprays, the soap-hot pepper spray showed a consistently higher reduction in number of aphids, followed by the soap-pepper-garlic combination, pepper spray, soap-garlic spray, pepper-garlic spray and garlic spray respectively. The rows that received the chemical treatment had the best overall reduction in aphid populations, whereas the control experiments always had varying number of aphids. Neither the chemical nor the botanical sprays showed any form of phytotoxicity on the kale plants. All treatments applied showed a significant ($p < 0.001$) reduction in kale aphid populations both in the first and the second treatment applications. It may be conclude that both pepper and garlic extracts are effective in the control of green aphids in kales, but their activity is increased by the addition of biodegradable potassium-based soap. It is recommended that the research should be repeated using different rates of the botanical extracts.