

## ABSTRACT

*Pests are a major threat to all types of crops, especially lettuce and spinach. In pest control, many farmers often apply insecticides indiscriminately, without considering the correct dosage, timing, method, and target, resulting in the unintended killing of non-target organisms such as natural enemies of pests, including parasitoids, predators, and pathogens. Some researchers have attempted to classify damage to plants instead of classifying the pests themselves.*

*Therefore, by classifying the types of pests on lettuce and spinach plants, farmers can take immediate action on their crops based on the specific type of pest infestation. The Convolutional Neural Network (CNN) method is widely used in image processing due to its high level of accuracy and better visual image recognition. This study applies three convolutional layers and two fully connected layers.*

*The MobileNetV2 architecture introduces two new features: Residuals and linear bottlenecks. The Convolutional Layer in MobileNetV2 adapts the filter thickness to match the input image thickness. The implementation aims to classify leaves affected by pests, consisting of three scenarios. The first scenario includes four classes: Healthy lettuce, Lettuce with pests, Healthy spinach, and Spinach with pests. The second scenario consists of four classes with more specific pest-related images: Lettuce with leafworm pests, Lettuce with thrips pests, Spinach with leaf miner pests, and Manganese-deficient spinach. The third scenario comprises six classes: Healthy spinach, Spinach with leaf miner pests, Manganese-deficient spinach, Healthy lettuce, Lettuce with leafworm pests, and Lettuce with thrips pests. The dataset includes three phases: training, validation, and testing, using the Adam optimizer. The results of the system testing for pest classification on lettuce and spinach, with four classes and epochs ranging from 10 to 100, yield varying accuracy values. Produces different accuracy values on several occasions testing scenario 1. Produces accuracy of 97% in scenario 2. Produces accuracy of 97% in scenario 3. Produces accuracy of 99%.*

**Keywords:** *CNN, lettuce and spinach pests, accuracy, MobileNetV2, classification.*