The requirement to improve the common pistachio psyllium (CPP) pest control is to increase the speed in monitoring its population at low densities. Because, controlling the population of this pest at low densities is better from an economic and practical point of view, and also as the compounds that can be used at low densities for control are less dangerous for human health, it is of special importance. One of the ways to achieve this goal is the use of artificial intelligence. Intelligent control and monitoring of the CPP population, which is the most important pest of the pistachio crop requires training different machine vision algorithms such as R-CNN, Faster R-CNN, RetinaNet, and YOLO. Training each of these machine vision algorithms requires a standard image dataset, which is time-consuming to prepare. Therefore, in this project, we will prepare a standard image dataset to improve the intelligent process of monitoring the CPP population in pistachio orchards. In this project, first, 1000 raw photos are taken with a resolution of 3472 x 3472 pixels of infested leaves with two simple backgrounds that include a black background and a complex background that consists of a background containing other leaves, soil, sky, etc. In image pre-processing, first, the photos will be converted to 3200 x 3200 pixels size and then cropped with 5 x 5 dimensions and converted into 640 x 640 pixel subsets. Then, these subsets, are annotated into three classes age 1, age 2-3, and age 4-5. To enrich the dataset, image processing techniques such as light adjustment, random cutting, random combination of images, scene change, etc are applied. Also, mosaic technique 9 will be used to enrich the background of the images. After the pre-processing of the images, to measure the quality of the created image dataset, models will be built using the standard Yolo5 algorithm and its performance on this dataset will be reported.

Keywords

Image dataset, pistachio common psyllium pest, machine vision

Aims

1- Creation of a standard image dataset for common pistachio psyllium pest.

2- Contributing to the smartization process of pistachio psyllid population monitoring in pistachio orchards.