

The efficacy of deep learning algorithm in classifying chilli plant growth stages

ABSTRACT

Automatic plant growth monitoring has received considerable attention in recent years. The demand in this field has created various opportunities, especially for automatic classification using deep learning methods. In this paper, the efficiency of deep learning algorithms in classifying the growth stage of chili plants is studied. Chili is one of the high cash value crops, and automatic identification of chili plant growth stages is essential for crop productivity. Nevertheless, the study on automatic chili plant growth stage classification using deep learning approaches is not widely explored, and this is due to the unavailability of public datasets on the chili plant growth stages. Various deep learning methods, namely Inception V3, ResNet50, and VGG16, were used in the study, and the results have shown that these methods performed well in terms of accuracy and stability when tested on a dataset that consists of 2,320 images of *Capsicum annum* 'Bird's Eye' plants of various growth stages and imaging conditions. Nevertheless, the results have also shown that the deep learning methods have difficulty classifying images with a complex background where more than one chili plant was captured in an image.

Keyword: Classification; Plant growth stages; Deep learning