

## I. INTRODUCTION

Strawberry is one type of plant that has high economic value and promising business prospects. A common problem in the cultivation of strawberry plants is that the seeds quickly get disease [1]. Based on the Indonesian Central Bureau of Statistics data from 2017 - 2019, strawberries' national production has been decreased. In 2017 total national strawberry production is 12.225 tons, keep decreasing until at 2019 total national production only 7.501 tons [2].

A few strawberry diseases can be detected from its leaves. A few of them are blight leaf, spot leaf, and scorch leaf. Common diseases that can be found in strawberry cultivation are diseases that are caused by a bacterial, fungus, mycoplasma-like organism, and virus [1]. Strawberry disease symptoms can be first seen from its leaf [3]. Detecting strawberry diseases from its leaf can prevent further damage to the fruit [4].

Recently, Deep learning has been applied to identifying plant diseases. Machine learning has been a lot used as a highly accurate and inexpensive tool for identifying plant diseases. CNN is one of the popular machine learning techniques for identifying plant diseases. In a previous study. Sladojevic and Arsenovic [5] proposed a CNN technique to identifying plant diseases by its leaf using CNN. The proposed technique able to identifying plant diseases with an accuracy of >96%. Hari and Sivakumar [6] proposed a CNN model to identifying several plant diseases. The model is called plant diseases detection neural network(PDDN). Their model can identify several plant diseases with an accuracy of 86%.

Many machine learning technique has been proposed to identifying strawberry diseases. Salunkhe et al. [3] used  $k$ -mean clustering and an artificial neural network to detect strawberry diseases by its leaf. The proposed technique can detect diseases with a precision score of 88% and a recall score of 77%. Xiao et al. [4] used CNN architectures, including VGG-16, GoogLeNet, and Resnet-50 technology, to detect diseases on the strawberry plant. The proposed models able to detect diseases with an accuracy of >98%.

The previous study mentioned above has provided a foundation for the machine learning approach to identifying diseases. However, using CNN to identifying a strawberry disease from its leaf has not yet been used. First symptoms from strawberry diseases can be seen from its leaf. Therefore, identifying diseases from it can prevent more damage to the fruit. In this study, we tried to propose a CNN model to identifying strawberry diseases from its leaf. We also compare the accuracy result with previous strawberry disease studies.