

## ABSTRAK

Pembibitan PTPN IV Kebun Pabatu memiliki potensi besar dalam mendukung produktivitas kelapa sawit, namun proses seleksi bibit masih memerlukan optimasi. Penelitian ini bertujuan mengklasifikasikan kualitas bibit kelapa sawit menggunakan algoritma *K-Nearest Neighbor* dan *Naïve Bayes* berdasarkan enam kriteria, yaitu umur bibit, tinggi tanaman, diameter batang, jumlah daun, panjang daun, dan status terserang hama. Pengujian terhadap 151 data testing menunjukkan bahwa *K-Nearest Neighbor* mengklasifikasikan 58,28% bibit sebagai unggul dan 41,72% tidak unggul berdasarkan performa pertumbuhan vegetatif, sedangkan *Naïve Bayes* menghasilkan 50,99% unggul dan 49,01% tidak unggul. Evaluasi *Confusion Matrix* menunjukkan *K-Nearest Neighbor* memperoleh *Accuracy* 94,70%, *precision* 93,18%, *Recall* 97,62%, dan *F1-Score* 95,35%, sementara *Naïve Bayes* memperoleh *Accuracy* 92,72%, *precision* 97,40%, *Recall* 89,29%, dan *F1-Score* 93,17%. Hasil penelitian menunjukkan bahwa *K-Nearest Neighbor* lebih optimal dalam mengklasifikasikan kualitas bibit kelapa sawit dan layak digunakan sebagai metode pendukung seleksi bibit secara objektif dan efisien. Dengan demikian, pendekatan klasifikasi berbasis data mining ini dapat menjadi solusi strategis dalam meningkatkan akurasi seleksi bibit secara objektif dan efisien.

**Kata Kunci:** Kelapa Sawit, *K-Nearest Neighbor*, *Naïve Bayes*.

## **ABSTRACT**

*The PTPN IV Pabatu Plantation nursery has great potential to support oil palm productivity, but the seedling selection process still needs optimization. This study aims to classify the quality of oil palm seedlings using the K-Nearest Neighbor and Naïve Bayes algorithms based on six criteria, namely seedling age, plant height, stem diameter, number of leaves, leaf length, and pest infestation status. Testing of 151 data points showed that K-Nearest Neighbor classified 58.28% of seedlings as superior and 41.72% as inferior based on vegetative growth performance, while Naïve Bayes produced 50.99% superior and 49.01% inferior. Confusion Matrix evaluation showed that K -Nearest Neighbor achieved an Accuracy of 94.70%, precision of 93.18%, Recall of 97.62%, and an F1-Score of 95.35%, while Naïve Bayes achieved an Accuracy of 92.72%, precision of 97.40%, Recall of 89.29%, and an F1-Score of 93.17%. The results of the study show that K-Nearest Neighbor is more optimal in classifying the quality of oil palm seedlings and is suitable for use as a method to support objective and efficient seedling selection. Thus, this data mining-based classification approach can be a strategic solution in improving the Accuracy of seedling selection objectively and efficiently.*

**Keywords:** *Oil Palm, K-Nearest Neighbor, Naïve Bayes.*