PREDIKSI LUAS PROYEKSI TAJUK POHON DOMINAN JATI PLUS PERHUTANI ASAL KEBUN BENIH KLON DENGAN MEMPERTIMBANGKAN KOMPETISI POHON

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INTISARI

Jati Plus Perhutani asal Kebun Benih Klon (JPP KBK) dikembangkan untuk mendapatkan tanaman yang lebih cepat tumbuh dibandingkan dengan jati konvensional. Salah satu upaya untuk mendapatkan tanaman yang lebih cepat tumbuh adalah dengan mengatur ruang tumbuhnya berdasarkan luas proyeksi tajuk. Informasi mengenai ruang tumbuh dan kompetisi diperlukan untuk pengaturan kerapatan tegakan. Tujuan dari penelitian ini adalah untuk memprediksi luas proyeksi tajuk pohon dominan JPP KBK menggunakan model *Gompertz* dengan mempertimbangkan kompetisi pohon.

Penelitian dilakukan pada petak yang memiliki kelas pertumbuhan baik. Data dikumpulkan dari pengukuran 30 sampel pohon dominan pada petak terpilih. Data yang diambil pada pohon sampel berupa umur, diameter, tinggi, radius tajuk, dan tinggi pada radius tajuk. Sedangkan data yang diambil pada pohon tetangga berupa umur, diameter, dan tinggi. Luas proyeksi tajuk (CPA) diprediksi dengan model *Gompertz* menggunakan analisis regresi non linier. Kriteria evaluasi model yang digunakan adalah koefisien determinasi dan *standard error of estimate*. Model divalidasi dengan kriteria *root mean square error* (RMSE), simpangan agregat (SA), dan simpangan rata-rata (SR).

Persamaan model prediksi luas proyeksi tajuk keseluruhan data dengan model *Gompertz* adalah $CPA = 17{,}915\ x\ e^{(-33{,}829\ x\ e^{(-0{,}668\ x\ umur)})}$. Model tersebut sudah signifikan, namun koefisien determinasi masuk dalam kategori rendah. Nilai SA dan SR sudah berada dalam rentang kriteria yang ditentukan dan RMSE sebesar 5,01 m^2. Persamaan model prediksi luas proyeksi tajuk bebas kompetisi dengan model *Gompertz* adalah $CPA = 19{,}212\ x\ e^{(-15{,}2\ x\ e^{(-0{,}498\ x\ umur)})}$. Model tersebut sudah signifikan dan koefisien determinasi meningkat menjadi kategori sedang. Nilai SA dan SR sudah berada dalam rentang kriteria yang ditentukan dan RMSE turun menjadi 1,10 m^2. Sehingga prediksi luas proyeksi tajuk bebas kompetisi lebih baik dibandingkan dengan keseluruhan data.

Kata kunci: Jati Klon, Kebun Benih Klon, Pohon Dominan, Luas Proyeksi Tajuk, Model *Gompertz*

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PREDICTING CROWN PROJECTION AREA OF DOMINANT TREE OF PERHUTANI'S TEAK PLUS FROM CLONAL SEEDS ORCHARDS BY CONSIDERING TREE COMPETITION

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ABSTRACT

Perhutani's Teak Plus from Clonal Seeds Orchards was developed to obtained fast growing plant than conventional teak. One way to obtained fast growing plant was by regulating the growing space based on crown projection area. Information about growing space and competition are required for managing the stand density. The research aims to predict the crown projection area of dominant trees of Perhutani's Teak Plus from Clonal Seeds Orchards using Gompertz model by considering tree competition.

The measurement was conducted on good growth compartments. The collected data were measurement of 30 dominant trees samples in selected plots. Each sample tree were measured and recorded its age, diameter, height, maximum crown radius, and height on maximum crown radius. The neighbor trees were measured and recorded its age, diameter, and height. Crown projection area (CPA) was predicted by Gompertz model using non-linier regression analysis. Model evaluation criteria were used coefficient determination and standard error of the estimate. Model were validated by root mean square error (RMSE), aggregate deviation (SA), and mean deviation (SR) criteria.

Model of predicting crown projection area for overall data by Gompertz model was expressed as $CPA = 17.915\ x\ e^{(-33.829\ x\ e^{(-0.668\ x\ age)})}$. The model was significant, but the coefficient of determination was classifitied in low category. The value of SA and SR were within the range of specified criteria and RMSE was 5.01 m^2. Model of predicting crown projection area for free of competition by Gompertz model was expressed as $CPA = 19.212\ x\ e^{(-15.2\ x\ e^{(-0.498\ x\ age)})}$. The model was significant and the coefficient of determination was increased to medium category. The value of SA and SR were within the range of specified criteria and RMSE was decreased to 1.10 m^2. So the predicting crown projection area for free of competition had better than predicting crown projection area for overall data.

Keywords: Clonal Teak, Clonal Seeds Orchards, Dominant Tree, Crown Projection Area, Gompertz Model

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