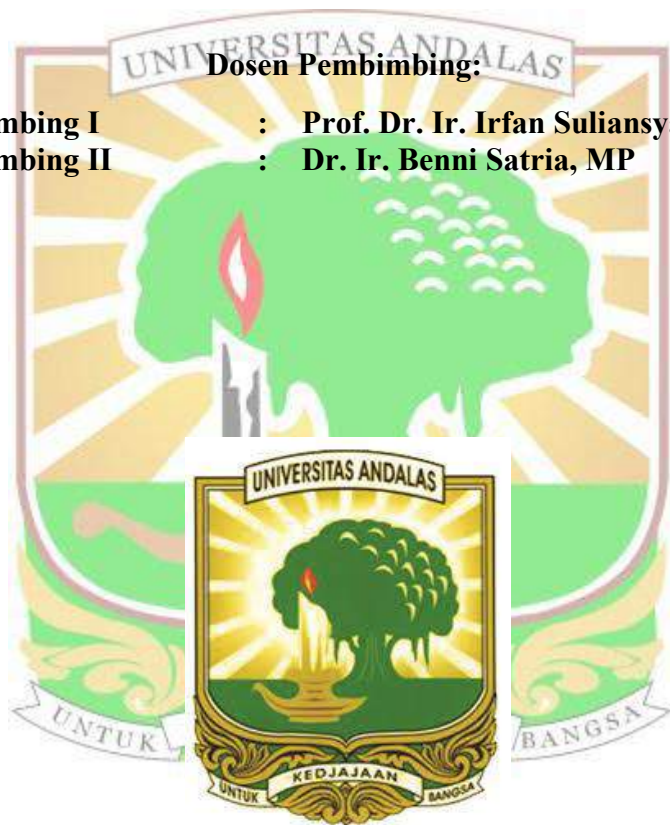


**EVALUASI KARAKTER AGRO-FISIOLOGI DAN
POTENSI HASIL BEBERAPA GENOTIPE GANDUM
(*Triticum aestivum* L.) DI DATARAN TINGGI**

TESIS

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RINGKASAN

Aries Novita Putri. Evaluasi Karakter Agro-Fisiologi dan Potensi Hasil Beberapa Genotipe Gandum (*Triticum aestivum* L.) di Dataran Tinggi. Dibimbing oleh Irfan Suliansyah dan Benni Satria.

Gandum (*Triticum aestivum* L.) merupakan salah satu komoditas pangan strategis yang kebutuhan konsumsinya di Indonesia terus meningkat dari tahun ke tahun, sementara sebagian besar kebutuhan tersebut masih dipenuhi melalui impor. Upaya peningkatan produksi gandum dalam negeri memerlukan pengembangan genotipe yang mampu beradaptasi pada kondisi agroekologi tropis, khususnya di dataran tinggi. Program pemuliaan melalui persilangan konvergen (*convergent breeding*) telah menghasilkan sejumlah galur harapan yang perlu dievaluasi kemampuan adaptasi, produktivitas, serta karakter fisiologinya sebelum dimanfaatkan sebagai calon varietas unggul. Evaluasi karakter agronomi dan fisiologi menjadi penting karena produktivitas tanaman tidak hanya dipengaruhi oleh faktor genetik, tetapi juga oleh kemampuan tanaman beradaptasi terhadap kondisi lingkungan tumbuh. Penelitian ini telah dilaksanakan di Jorong Galagah Nagari Alahan Panjang, Kecamatan Lembah Gumanti, Kabupaten Solok dengan ketinggian ± 1616 mdpl dari Mei hingga Juli 2026. Pengamatan dan analisis dilakukan di Laboratorium Agronomi Fakultas Pertanian Universitas Andalas, Laboratorium PT. Wiwiadi Bintang Sains Padang, serta Laboratorium Kimia, Biokimia Hasil Pertanian dan Gizi Pangan Fakultas Teknologi Pertanian Universitas Andalas. Penelitian ini menggunakan Rancangan Acak Kelompok (RAK) dengan genotipe sebagai perlakuan. Bahan tanaman terdiri atas 14 genotipe gandum yang meliputi dua varietas introduksi (IS-Jarissa dan VEE), lima galur hasil persilangan konvergen (CBF6-22, CBF6-23, CBF6-25, CBF6-26, dan CBF6-27), lima varietas adaptif dataran tinggi (Nias, Dewata, GURI 4 Agritan, GURI 5 Agritan, dan GURI 6 Agritan), serta dua varietas adaptif dataran menengah (GURI 7 Agritan dan GURI 8 Agritan). Kondisi iklim, karakter pertumbuhan, karakter hasil, dan karakter fisiologi sebagian dianalisis secara deskriptif dan sebagian menggunakan uji F pada taraf nyata 5%, yang dilanjutkan dengan uji kontras ortogonal pada taraf nyata 5% menggunakan Microsoft Excel[®] 2021. Hasil penelitian menunjukkan bahwa beberapa genotipe memberikan pengaruh nyata terhadap karakter pertumbuhan dan komponen hasil tanaman gandum. Galur persilangan konvergen CBF6-27 merupakan genotipe dengan performa terbaik karena menghasilkan hasil per petak tertinggi sebesar 453,03 g, disertai jumlah biji per malai utama yang tinggi (31,60 butir) dan bobot biji per malai utama sebesar 1,36 g. Pada karakter fisiologi, CBF6-27 juga menunjukkan kadar air relatif daun tertinggi (89%), kadar MDA terendah ($1,10 \mu\text{mol g}^{-1}$ bobot segar), serta aktivitas enzim SOD sebesar 1,42 unit g^{-1} bobot segar, yang menunjukkan kemampuan mempertahankan keseimbangan fisiologi selama pertumbuhan.

SUMMARY

Aries Novita Putri. Evaluation of Agro-Physiological Traits and Yield Potential of Several Wheat (*Triticum aestivum* L.) Genotypes in the Highlands. Supervised by Irfan Suliansyah and Benni Satria.

Wheat (*Triticum aestivum* L.) is a strategic food commodity with consumption demand in Indonesia rising annually, while the majority of this demand is still met through imports. Efforts to increase domestic wheat production require the development of genotypes capable of adapting to tropical agro-ecological conditions, particularly in highland areas. A breeding program utilizing convergent breeding has produced several promising lines; these require evaluation regarding their adaptability, productivity, and physiological traits before they can be considered as candidate superior varieties. Evaluating agronomic and physiological traits is crucial because crop productivity is influenced not only by genetic factors but also by the plant's ability to adapt to its growing environment. This research was conducted in Jorong Galagah, Nagari Alahan Panjang, Lembah Gumanti District, Solok Regency at an elevation of approximately 1,616 meters above sea level from Mei to July 2026. Observations and analyses were performed at the Agronomy Laboratory of the Faculty of Agriculture at Andalas University, the laboratory of PT. Wiwiadi Bintang Sains Padang, and the Laboratory of Chemistry, Agricultural Product Biochemistry, and Food Nutrition at the Faculty of Agricultural Technology, Andalas University. The study employed a Randomized Complete Block Design (RCBD) with genotypes serving as the treatments. The plant materials consisted of 14 wheat genotypes, comprising two introduced varieties (IS-Jarissa and VEE), five lines derived from convergent breeding (CBF6-22, CBF6-23, CBF6-25, CBF6-26, and CBF6-27), five highland-adapted varieties (Nias, Dewata, GURI 4 Agritan, GURI 5 Agritan, and GURI 6 Agritan), and two mid-altitude-adapted varieties (GURI 7 Agritan and GURI 8 Agritan). Climatic conditions, growth characteristics, yield traits, and physiological traits were analyzed partly through descriptive methods and partly using the F-test at a 5% significance level, followed by orthogonal contrast tests at the 5% significance level using Microsoft Excel[®] 2021. The research results indicate that several genotypes significantly influenced the growth characteristics and yield components of the wheat plants. The convergent cross line CBF6-27 was the best-performing genotype, producing the highest yield per plot (453.03 g), along with a high number of grains per main spike (31.60 grains) and a grain weight per main spike of 1.36 g. Regarding physiological traits, CBF6-27 also exhibited the highest leaf *Relative Water Content* (89%), the lowest MDA content (1.10 $\mu\text{mol g}^{-1}$ fresh weight), and an SOD enzyme activity of 1.42 units g^{-1} fresh weight, demonstrating an ability to maintain physiological balance during growth.