

Pengujian Kemurnian Genetik Benih Jagung Hibrida F1 Varietas Jafran 8 Berbasis Marker *Simple Sequence Repeats* (SSR), Genetic Purity Testing of F1 Hybrid Corn Seeds of Jafran 8 Variety Based on Simple Sequence Repeats (SSR) Markers. Pembimbing: Moch. Rosyadi Adnan, S.Si., M.Sc.

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ABSTRACT

Hybrid corn is a strategic commodity with significant contribution to national food security. Genetic purity of hybrid seeds is crucial in determining crop quality and agronomic performance. Conventional *Grow Out Test* (GOT) methods have limitations of long duration, high environmental influence, and dependence on observer expertise. This study aims to develop a rapid hybridity testing method using SSR markers and identify suitable primers for F1 hybrid corn seeds. The research was conducted from August to December 2025 at the Innovation Garden Field and Bioscience Laboratory of Politeknik Negeri Jember using corn seed varieties AR 45 (female parent), AR 12 (male parent), and JAF 8 F1. The study employed a non-factorial Randomized Complete Block Design with three varieties, each consisting of 62 plants per plot. Molecular testing included DNA extraction from young leaves at 5 days after planting using CTAB protocol, PCR amplification with 15 SSR primers distributed across 10 corn chromosomes, and electrophoresis on 1-2% agarose gel. Results showed that of the 15 primers tested, 9 primers produced positive amplification. Primers UMC1133 (chromosome 6) and UMC1545 (chromosome 7) demonstrated the best performance with consistent amplification across all varieties. Primer Phi083(710) displayed high polymorphism effectively distinguishing varieties. GOT observations confirmed that variety JAF 8 F1 exhibited hybrid vigor with the highest performance in all quantitative parameters. Integration of SSR markers with GOT provided dual validation of genetic purity. SSR markers can accelerate purity testing from at least one growing cycle to several days after germination. This study recommends the use of primers UMC1133, UMC1545, UMC1363, UMC1858, and Phi083(710) as a standard marker panel for hybrid corn seed purity testing.

Keywords: genetic purity, *Grow Out Test*, hybrid corn, hybrid vigor, PCR, SSR markers