

INTRODUCTION

Maize is the second most important food commodity in Indonesia, after rice. Indonesia's maize production is the highest in Southeast Asia, at 19.98 million tons. Maize production in Indonesia can be increased by utilizing suboptimal land. The area of suboptimal land in Indonesia is 137.00 million hectares, with peatland: 14.90 million hectares, dry acid land: 108.80 million hectares, and dry climate dry land: 13.30 million hectares. Indonesia's dry climate drylands are spread throughout Indonesia, including Madura Island. The drylands on Madura Island cover 360,000 hectares. Penanaman jagung di Pulau Madura berdampak pada rendahnya produktivitas jagung di Pulau Madura yaitu sebesar 2.15 ton ha⁻¹. One solution to overcome the problem of low maize production in dry climates is to develop early-maturing, high-yielding maize varieties. Early maturity maize varieties are well suited for planting in dry climates because they have relatively short water requirements and shorter growing periods.

The stages of assembling superior maize varieties are germplasm characterization, assembly of maize varieties, and yield testing of candidate maize varieties [8]. Identification of potential maize germplasm has produced several lines with high yield, early maturity, and drought resistance. The assembly of hybrid maize varieties using the diallel and line x tester methods produced several potential cross combinations to be developed into superior hybrid maize varieties. The next stage carried out is testing the stability of candidate maize varieties in the growing environment. This test is needed because the interaction between genotype and environment (GxE) can cause differences in the appearance of genotypes across locations, so an analysis method is needed that can separate and explain the interaction pattern.

Stability testing is required before releasing a variety, as the plants released as varieties must not only have superior characteristics but also be able to adapt and produce consistently across various environments. One of the stability test methods used is the AMMI (Additive Main Effect and Multiplicative Interaction) model. The AMMI method can detect the adaptability of a genotype to various environments. The AMMI method is very suitable for detecting genotype stability because it can analyze the effects of genotype, environment, and genotype by environment (GxE) interactions. In addition, the AMMI method can precisely analyze and explain GxE interaction patterns. The AMMI method combines two statistical approaches, namely Analysis of Variance (ANOVA) to separate the main effects of genotype and

environment, and Principal Component Analysis (PCA) to describe the GxE interaction pattern. The use of the AMMI method can facilitate the selection and release of superior varieties by accurately describing a genotype adaptability and stability.

Determining the stability of candidate maize varieties is the final stage in the maize variety release process. The results of stability tests can provide recommendations to plant breeders for selecting genotypes with high, stable yield potential across several test locations. The research aims to test the characteristics of harvest age and production per hectare of eighteen candidate hybrid maize varieties at three test locations (Bangkalan, Pamekasan, and Sumenep).