

Introduction

Breeding maize varieties with high production and drought resistance is one solution to the problem of low maize production in dryland areas [1]. Maize varieties with these character can adapt to environmental conditions with limited water and achieve optimal production [2]. The initial step in producing maize varieties with the desired character is to identify the lines (germplasm) to be used as parents in assembling the varieties [3], [4]. The selected lines must have high yield potential and be drought stress tolerant. Assembling maize varieties using parents w1ith the desired characteristics increases the likelihood of success in assembling the desired variety [5]. Parents with superior characteristics (high production and drought resistance) carry genes that control these characters, increasing the likelihood that these genes will be passed on to new varieties created from these parents [6]. Linking maize varieties using parents with desired characteristics will increase the efficiency and effectiveness of variety assembly, as the breeding program will be more focused and faster [7].

Morphological characterization of potential maize lines is very important for determining which lines will be used to assemble maize varieties [8]. Observation of morphological characters (quantitative and qualitative) is used to identify phenotypic diversity, which describes the genetic potential of each line [9]. Morphological character information not only functions as a basis for selection but also as a tool for grouping lines based on similarities or differences in the characters they possess [10]. Analysis of kinship relationships between lines can be conducted based on the similarities and differences in the characteristics of the lines being tested. Lines with distant kinship indicate different genetic backgrounds, making them potential hybrid varieties, as they exhibit maximum heterosis in crosses. Heritability calculations can be performed on quantitative characters to determine the extent to which genetic factors influence the quantitative characteristics of the tested lines [11]. Heritability values can be used as a basis for selecting the breeding program for assembling plant varieties [12][13]. In addition, through quantitative character observations, correlations between characters can be analyzed, which helps determine selection methods in assembling plant varieties [14].

Identification of drought stress resistance in potential maize lines is an important step toward developing superior maize varieties that are drought stress resistant [15]. The value used to determine lines' resistance to drought stress is the drought sensitivity index (DSI). The DSI value provides information on the extent of decline in plant characteristics due to drought stress [16]. Lines resistant to drought stress can be grouped based on DSI values. Lines with DSI value to drought stress because they show a slight decrease in yield due to drought stress. Furthermore, lines with $DSI > 1$ are sensitive to drought stress, as they exhibit a significant yield decrease under drought [17].

Morphological characterization and identification of line resistance to drought stress are important activities in the assembly of superior maize varieties [18]. Plant breeders can select desired parents based on the morphological diversity of the tested lines. Furthermore, identifying lines' resistance to drought stress can facilitate the selection of parents that are drought stress resistant. These two activities will help develop superior maize varieties with high production potential and drought resistance. This research aims to characterize the morphology and identify

drought stress resistance in 1. This research used a non-factorial randomized block design with one treatment, namely genotype. The genetic material used in the research consisted of 22 genotypes, comprising 20 pure lines and two comparison varieties (Bisi-X and Jakarin). Each treatment was repeated three times so that there were 66 experimental units. Each treatment was repeated three times, resulting in 66 experimental units. Drought stress using the CYMMYT method [19], namely drought stress is carried out when the plants are 50 days after planting (DAP) until harvest, but irrigation is provided with field capacity from 0 to 40 DAP with an interval of every 10 days. Fertilization is given in three stages, namely when the plants are 7 days after planting (200 kg ha⁻¹ SP-36, 100 kg ha⁻¹ Urea and 50 kg ha⁻¹ KCl), 25 days after planting (100 kg ha⁻¹ Urea and 50 kg ha⁻¹ KCl, and 40 days after planting (100 kg ha⁻¹ Urea and 50 kg ha⁻¹ KCl).