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ABBREVIATION

50% fl.	50 % flowering
C1 ,C2	Cycle 1 and 2 of selction
CAT	Catalase
Chl	chlorophyll
CWSI	crop water stress index
EC	electric conductivity
ETo	Evapotranspiration
G.C.V	genotypic coefficients of variability
GA %	genetic advance from selection
h²	heritability in narrow sense
I_G	stomatal conductance
L of fr.	Length of fruiting zone
LOP	Leaf osmotic potential
NC	number of capsules
NDVI	Normalized Difference VegetationIndex
°C	degree of temperature
PC	proline content
PCV	phynotypic coefficients of variability
PH	plant height
Pop.	Population
POX	Peroxidase
R²	Coefficients of determination
RAPD	Random Amplified Polymorphic DNA
RWC	Relative water content
S	selection difference
SPAD	chlorophyll index
T_{wet}	leafwet temperature
T_{leaf}	canopy leaves temperature
W.U.E	Water use efficiency

Name	EmanTalaatAbdou
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Faculty	Agriculture, Suez Canal University
Department	Agronomy
The place	Ismailia
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Supervised by	Prof. Dr. Tarek Youssef Bayoumi..... Prof. Dr. Samar. A. M. Elshakhess Dr. Soad A. M. Mohamed.....

Abstract

Three experiments were conducted during the three constitutive seasons (2013 , 2014 and 2015) for sesame populations which resulting from F₂ in agriculture experimental station .The four populations were derived from crossing among the six parents i.e., population 1 (for Shandaweel 3* Line N.A 673* Line N.A 357-11-1), population 2 (Line N.A b14* Line N.A 289* Line N.A 560), population 3 (Shandaweel3 * Line N.A 560 *Line N.A b14) and population 4 (Line N.A 560* Line N.A 289* Line N.A 357-11-1) which were grown in 2013 season. Seeds of F₂ plants were planted in separate rows. Visually, 1200 F₂ plants were selected according to phenotype; giving preference to drought tolerance. Each plant was harvested separately and planted in a separate row in the F₃ generation under three water regimes, 300 plants for each water regime in 2014. Selection of plants from the planting in the F₃ generation was done in the same way. According to some yield components, 25 F₄ families' plants were selected from each combination and planted under the three water regimes in 2015. At harvest, the best 10 lines per combination were selected based on drought tolerance traits. The results can be summarized as follow: The results implied that there were considerable genetic variations among evaluated populations. The results clearly indicated that any change in the amount of irrigation water less than optimum condition reduces the1000-seed weight and yield. The population No.4 which had high RWC, WUE, proline and enzymes activity under stress conditions and may be considered more drought tolerance. The results inveterate the effectiveness of the RAPD markers for the detection of polymorphism among sesame genotypes based on estimation of similarity coefficients for the identification of genotypes and hybrids by distinctive fingerprints. Thermal images were more effective for selecting sesame genotypes for drought.

Key words

Sesamum indicum L., drought, NDVI, Infra red thermal images, Enzymes, RAPD, RWC, WUE, proline and RAPD markers