ABSTRACT

NAZLY ASWANI. Genetic Variation among Watermelon Varieties (Citrullus lanatus [Thunb.] Matsum & Nakai var. lanatus) based on Agronomical Characters and Resistance against Fusarium Wilt (Fusarium oxysporum f.sp. niveum Snyder & Hansen). Under direction of SOBIR, MEMEN SURAHMAN and SURYO WIYONO.

Breeding for disease resistance and high yield as well as fruit quality e.g. attractive rind and flesh colors are of watermelon improvement strategies to better meet market demands. Thus, evaluation and analysis of genetic variation toward agronomical characters on commonly cultivated watermelon varieties would be one of Indonesia initial watermelon breeding programs. This work should be collaborated with evaluation in cultivar disease resistance e.g. fusarium wilt (Fusarium oxysporum f.sp. niveum), of which its control so far still depends on resistant cultivar.

The study consisted of two experiments: (1) Evaluation toward agronomical characters on watermelon varieties (Citrullus lanatus [Thunb.] Matsum & Nakai var. lanatus) and (2) Evaluation toward resistance against three isolates of Fon (Fusarium oxysporum f.sp. niveum). The first experiment was aimed to analyse genetic variation among watermelon varieties and screen varieties with high yield and/or attractive performance. The second experiment was aimed to screen varieties with good resistance against all of Fon isolates.

Thirty three of watermelon varieties were subjected in the first experiment designated on Randomized Complete Block Design with three replications. Meanwhile, three isolates of Fon i.e. ‘Karawang’, ‘Lampung’ and ‘Purwakarta’ were used against 35 watermelon varieties in the second experiment designated on Completely Randomized Design with two replications.

Evaluation of agronomical characters showed that based on ANOVA there were significant differences among 33 varieties for all quantitative characters. Based on all agronomical characters, Principal Component Analysis explained 75.69% total variance, whereas cluster analysis distinguished 33 varieties into three groups with 68% genetic variation. Resistance evaluation against Fon isolates showed that of 35 varieties, six varieties were demonstrated having good resistance against all of three Fon isolates. Difference was also observed within incubation period through either among varieties against the same isolate or variety against various isolates. Shortest incubation period occured on variety ‘Hitam Manis’ against isolate Karawang (< 10 days after inoculation) and the longest one occured on ‘New Dragon’ against isolate Lampung (> 23 days after inoculation). Therefore, apparently there was gene-for-gene resistance mechanism underlying through differences of genotypic reaction against the three of Fon isolates reflected in disease index and incubation periods.