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Evaluation and Selection of Elite Jatropha Genotypes for Biofuel

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Abstract : Jatropha curcas L., a drought tolerant and monoecious perennial shrub, has received attention worldwide during the past decade. Realizing the facts, the Indonesian government has decided to option for Jatropha and palm oil for in country biofuel production. To support the program development of high yielding jatropha varieties is necessary. This paper reviews Jatropha improvement program in Indonesia using mass selection and hybrid development. To start with, at the end of 2005, in-country germplasm collection was mobilized to Lampung and Nusa Tenggara Barat (NTB) provinces and successfully collected 15 provenances/sub-provenances which serves as a base population for selection. A significant improvement has been achieved through a simple recurrent breeding selection during 2006 to 2007. Seed yield productivity increased more than double, from 0.36 to 0.97 ton dry seed per hectare during the first selection cycle (IP-1), and then increased to 2.2 ton per hectare during the second cycles (IP-2) in Lampung provenance. Similar result was also observed in NTB provenance. Seed yield productivity increased from 0.43 ton to 1 ton dry seed per hectare in the first cycle (IP-1), and then 1.9 ton in the second cycle (IP-2). In 2008, the population IP-3 resulted from the third cycle of selection have been identified which were capable of producing 2.2 to 2.4 ton seed yield per hectare. To improve the seed yield per hectare, jatropha hybrid varieties was developed involving superior provenances. As a result a Jatropha Energy Terbarukan (JET) variety-2 was released in 2017 with seed yield potential of 2.6 ton per hectare. The use of this high yielding genotypes for biofuel is discussed.

Keywords : Jatropha curcas, provenance, biofuel, improve population, hybrid
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