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Cultivation of niger-seeds – a treasure plant to secure availability of edible oil in Ethiopia

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Abstract

The availability of edible oil in Ethiopia is limited typical plants as rape or sun flower are not cultivated. Niger-seed (*Guizotia abyssinica* Cass.) is native to Ethiopia and has a very good quality for edible oil, but underestimated in this regard and exported as birdfeed in industrial countries. In northern Ethiopia as in the highland area of Amhara Region niger-seed was cultivated long time by small holder farmers. The aim of this study was to identify land with favourable soil and climate conditions and sufficient water availability for niger-seed cultivation, as well convenient transportation to oil mills. In the field experiments were investigated cultivation methods using the cultivars Fogera and Kuyu, different nitrogen fertilisation in their effect on seed yield, seed quality and postharvest handling, as well as the oil expression efficiency and the quality parameters for niger-seed. The field experiments were prepared in a randomised block for statistical analyses with three repetitions. Based on field study in the locations, Adet and Koga, three seed rates and three fertiliser rates the highest mean niger-seed yield was 1384.6 kg ha^{-1} at Adet location (rainfed) followed by location Koga (rainfed) with 1064.7 kg ha^{-1} and Koga (irrigation) with 967.0 kg ha^{-1} showing significant difference. The seeds were stored in the laboratory for four weeks before the analysis started. Before further laboratory analysis started was ascertained the seed yield (kg ha^{-1}), moisture content (%) (dry basis), thousand seed mass (gram), and total ash content (%). Oil content determination was done for all the three cultivations for comparison i.e. Adet (rainfed), Koga (rainfed), and Koga (irrigation). Fatty acid and vitamin E determination was only done for the Adet experimental station (rainfed). The oil content by experimental location was 41.54 % for Koga (rainfed) followed by 39.59 and 38.67 % for Koga (irrigation) and Adet (rainfed) respectively showing significant difference whereas the Ash content showed a reverse trend of oil content. Fatty acid composition did not show significant difference in any treatment. Significant mean -tocopherol of 80 mg/100 g (70 to 89 mg/100 g) was determined for increasing seed and nitrogen rates.

Keywords: Cultivation conditions of nigerseed, cultivation irrigated and non-irrigated, oil content, seed quality, seed yield, -tocopherol and oil expression

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