



Assessment of Agronomic and Morphological Characteristics of Iranian Spinach Landrace in Esfahan Province

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Received: 25-11-2015

Accepted: 27-07-2016

Introduction: Spinach is one of the most important leafy vegetables, rich in calcium, phosphorus, potassium, vitamin C and *B*-carotene, and it is likely to be Iran's origin. More than 30 percent of the area under cultivation of in Iran leafy vegetables, allocated to spinach plant. Spinach is a cool season crop and its cultivation is done in the fall and in early spring. Various regions of Iran, has the vast genetic diversity in relation to the mass of spinach. In a study to evaluate the yield and agronomic traits spinach 121 mass Iran, the masses were divided into six clusters that each cluster has specific morphological and agronomic traits. Leafy vegetables, especially spinach are the main sources of nitrate absorption and about 70 percent of total dietary nitrate intake per person per day is provided by leafy vegetables.

Material and Methods: To study the preliminary agronomic and morphological traits and nitrate amounts of 100 Iranian spinach mass are available in GenBank, an investigation was carried out in Agriculture and Education Center Research in Esfahan for two years (2013-2014) by using of five mass dominant cultivars, and two control landrace (Varamin 88 and Varamin prickly seed). The aim of the first year of the study was the primary isolation of superior landraces based on agronomic traits of spinach. At the end of the first year of growth, seed traits, including the type (smooth-prick), the width of the blade, leaf color, wrinkling of leaf area, leaf thickness, the petiole (standing, half-standing and sleeping), petiole length, shape of leaf, the shape of the leaf tip, bolting during plant growth and the number of male and female were determined. A total of 25 landraces selected in the first year of study were compared in the second year using a randomized complete block design with three replications. Studied traits were: yield, dry matter yield, number of leaves, leaf length, leaf width, and petiole length and nitrate levels. Statistical analyses of the data, correlated traits were performed using SAS software and comparisons of means calculated by using LSD at 5%.

Result and Discussion: The results showed that 21.5% of the populations used in this study had the petiole with a standing (vertical) position and 25.2% of them had a long petiole. Length of the petiole and hoisted were considered desirable trait for mechanized harvesting. However, varieties have high nitrate concentrations, or in cases where the management of nitrogen fertilizers does not do well, longer tail leaves are an undesirable trait because the accumulation of nitrate in the tail leaves is more than leaf spinach. 35.5% of spinach leaves landrace used in this study were green color. Leaf color in leafy vegetables is very important. Leaf length, have a range of 11 cm in the Kashan, up to 18 cm in mass TN-69-101 (collected from Lorestan). In this study the agronomic characteristics of the mass of the spinach, length of leaf blade mass in Kashan, Shahreza and Najaf Abad, were 15.50, 11.50, and 9.50 cm, respectively, and all three populations were significantly different in this respect. A significant positive correlation was observed between leaf length and leaf width (0.78**). The highest of fresh yield was 32.59 t ha⁻¹ and produced by Varamin 88 that with six masses (TN-69-73, Varamin- prickly, TN-69-74, TN-69-153, TN-69-140, TN-69-58) did not differ statistically. Three populations of TN-69-153, TN-69-140 and Varamin- prickly (advanced masses prickly Varamin) both in terms of fresh and dry matter yield were superior. The (TN-69-78) mass with 17 leaves, the highest, and (TN-69-22) mass with 11/33 leaves, the lowest number of leaves produced among the different masses. Leaf blade width in the mass TN-69-31, was equal to 12/38 cm and with the eleven other populations had a significantly blade width more than other the masses. In terms of nitrate in shoots, TN-69-153 population with 1708 mg of nitrate per kg of dry matter had the highest amount of nitrate.

Conclusion: The results of this study showed that considering the diversity traits among different populations of spinach in various parts of the Iran can be provide suitable potential for agronomic and breeding purposes. The masses after selection and purification can be available to farmers and producers.

Keywords: Dry matter, Nitrate, Petiole, Yield

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