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## THE IMPACT OF THE CULTIVATION TECHNOLOGY ELEMENTS ON THE FENNEL SEED PRODUCTIVITY

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**Keywords:** variety, row spacing, sowing method, yielding capacity, weight of 1000 seeds.

Fennel (*Foeniculum vulgare Mill.*) is a popular herb belonging to the *Apiaceae* family with a long history of use in traditional medicine for a wide range of ailments. The beneficial properties of plants are caused by the essential oil and its major components – anethole, fenchone, estragole. Medicinal applications of fennel include use as antispasmodic, carminative, diuretic, analgesic, expectorant, laxative, stomachic, appetite stimulant, anti-inflammatory cure. Essential oil can be used as a valuable antioxidant, antibacterial and antifungal agent [1].

In Ukraine the traditional zones of fennel cultivation are Western regions. Since 2011, due to the rapid development of various industries, scientific research and the introduction of this crop into cultivation under arid conditions in the southern Steppe of Ukraine have been successfully conducted [2, p. 238]. Fennel cultivation in this zone requires improvement of separate elements of

growing technology, such as varietal composition and row spacing.

The experiments were carried out in 2016-2018 on the dark chestnut soils of Nadiia farm of Velyka Oleksandrivka district in Kherson region, meeting generally accepted requirements and recommendations. The experimental design included the following factors and their variants: Factor A – fennel variety: Oksamyt Krymu, Mertsyshor; Factor B – row spacing: 15, 30, 45, 60 cm. The trial was based on a split plot method with a four-fold replication. The sown area of the second-order elementary plot was 70 m<sup>2</sup>; the record plot was 55 m<sup>2</sup>. The research tasks included determining the impact of the studied factors on the fennel seed productivity under dry conditions of the southern Steppe of Ukraine.

The technology of fennel cultivation was generally accepted, besides the factors studied. Winter wheat was the preceding crop in the experiment. We applied 60 kg of the active ingredi-

ent of ammonium sulphate per ha. Seeding date was the third ten-day period of March, seeding rate – 5 kg/ha, seeding depth – 2-3 cm, plant density – 600 thousand/ha. Fennel seeds were harvested when the fruits reached maturity on the central umbel and first-order umbels.

Seed productivity of fennel varied depending on the interaction of the investigated parameters of the technological practices in the range from 1.01 to 1.32 t/ha. The yielding capacity of fennel seeds was minimal in variants of sowing the Mertsyshor variety with row spacing of 15 and 60 cm and came to 1.01 and 1.06 t/ha, respectively. The investigated index reached the highest value of 1.32 t/ha under sowing the Oksamyt Krymu variety with row spacing of 45 cm.

On average, by factor A, the highest level of crop productivity (1.18 t/ha) was provided by sowing the Oksamyt Krymu variety. The mean factor value of seed yield on the experimental plots of sowing the Mertsyshor variety was lower by 5.1%.

When fennel was sown with row spacing of 45 cm, average the seeds yielding capacity amounted to 1.29 t/ha. Sowing with row spacing of 15 and 30 cm led to a decrease of this indicator by 18.6 and 9.3%, respectively. With an increase in the row spacing up to 60 cm, the seed productivity decreased

by 15.5%. The research results indicate a preference for fennel sowing with row spacing of 45 cm compared to other sowing methods under study.

The highest weight of seeds per plant (2.20 g) was observed on the experimental plots of the Oksamyt Krymu variety sowing with row spacing of 45 cm. The number of seeds per plant was also maximal in this version and amounted to 414. Seed productivity of certain plant reduced when fennel variety Mertsyshor was sown in comparison with the Oksamyt Krymu variety. Changing the row spacing compared with 45 cm led to a decrease in the studied parameters.

The weight of 1000 fennel seeds varied depending on the interaction of the investigated elements of the growing technology in the range from 4.39 to 5.31 g. This indicator was minimal on the experimental plots of sowing the Mertsyshor variety with row spacing of 15 and 60 cm and made up 4.39 and 4.53 g, respectively. The maximum of this index (5.31 g) was recorded in the variant of the interaction of sowing fennel variety Oksamyt Krymu and seeding with row spacing of 45 cm.

On the experimental plots of sowing the Oksamyt Krymu variety the mean factor value of the weight of 1000 fennel seeds amounted to 4.88 g. The investigated index of the Mertsy-

shor variety reduced of 3.9%. The most favourable conditions for seeds formation were observed under sowing with row spacing of 45 cm. In this variant, the weight of 1000 fennel seeds reached the highest mean factor value of 5.22 g. Inter-row narrowing from 45 to 30 and 15 cm caused a decrease of this indicator by 7.3 and 14.0%, respectively. With an increase in the row spacing to 60 cm, the weight of 1000 fennel seeds decreased by 11.9%.

Thus, the most favourable conditions for fennel seed formation on

dark chestnut soils of the southern Steppe of Ukraine were ensured by the interaction of such parameters of the investigated technological practices as the Oksamyt Krymu variety, row spacing of 45 cm.

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