

AGROTECHNOLOGY OF MAIZE CULTIVATION

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Abstract

This article provides information on soil preparation for maize cultivation, seed preparation for sowing, sowing periods and methods, maize grain and silage yield, fertilizer application rates, and irrigation regimes.

Keywords: Maize, grain, silage, irrigation regime, fertilizer application rates, seed.

Introduction

At present, one of the main factors limiting the yield of autumn cereal crops under various soil and climatic conditions of the Republic is the water shortage that occurs during the growing season. On the other hand, in most regions, irrigation of grain crops does not adequately take into account the specific local soil-climatic conditions particularly the soil's water-physical properties-and the actual water demand of autumn cereals at different stages of growth and development. Therefore, fully meeting the plant's water requirement at each stage of development is a guarantee of obtaining a high yield. To fully provide plants with water, the available irrigation water is often insufficient. Thus, finding non-traditional irrigation methods to continuously meet the plant's water needs is one of the most important factors.

Soil preparation for maize cultivation. For sowing maize, the land is plowed in autumn. Depending on the soil characteristics, the plowing depth can be 30-35 cm or deeper. In fields infested with perennial weeds, after autumn plowing, root residues are removed using a lever or spring harrow cultivator or a chisel.

In saline soils, leaching is carried out to remove salts. Plowing is performed using a sod-turning or two-tier plow. In early spring, to preserve soil moisture, plowed areas are harrowed. If weeds appear in the plowed soil before sowing, cultivation is carried out to a depth of 8-10 cm, followed by harrowing and leveling with rollers.

Seed preparation for sowing. Currently, seed is prepared in specialized seed production centers and sent to farms for sowing. However, seed preparation can also be done on the farm itself. In that case, maize cobs must be stored until sowing. During storage, the moisture content



should not exceed 14-15%. About 10-15 days before sowing, the cobs are shelled. Seeds from the middle part of the cob are used for sowing. Kernels from the bottom and top (tip) parts of the cob differ in size and have lower germination rates; therefore, kernels from the bottom and top 1.2–2.5 cm are removed and not used for sowing. The remaining middle section is shelled. For shelling, a hand-operated maize sheller (MKR-0.25) is used. The shelled seeds are cleaned and sorted by size using special machines such as OSM-3, OSM-ZU, OD-Yu, and VS-2. Sowing seeds must have a purity of 99.0-99.8% and a germination rate of 85-95%.

Sowing periods and methods. Maize is sown in spring when the soil temperature reaches 10 °C. It can also be sown in summer. In the southern regions of Uzbekistan, sowing is done from March 15-20; in Tashkent, Samarkand, and the Fergana Valley, from March 20-25; and in Bukhara, Khorezm, and the Republic of Karakalpakstan, from April 10. In general, in each region, it is recommended to complete maize sowing before cotton sowing begins. Late sowing significantly reduces yield.

Maize is sown in wide rows with row spacing of 60, 70, or 90 cm, leaving a single plant every 15-20 cm depending on the variety. Early-maturing varieties and hybrids should have 75-80 thousand plants per hectare, medium-maturing varieties and hybrids 65-70 thousand plants, and late-maturing varieties (O'zbekiston tishsimon) and hybrids 50-55 thousand plants per hectare. The seed rate per hectare depends on seed size and germination, and generally ranges from 15-20 kg to 25-30 kg. Seeds are planted at a depth of 5-8 cm.

Maize is relatively drought-tolerant (transpiration coefficient-270), but in irrigated farming conditions it yields 10 times or more than in rainfed conditions. With proper agronomic practices and scientifically based irrigation regimes, maize can produce 6-10 t/ha of grain and 40-60 t/ha of silage in Uzbekistan. Maize yield depends directly on how well the crop is supplied with water during its growth phases. The critical water demand period begins 10-12 days before tasseling and lasts 30-37 days. During flowering, maize is highly sensitive to optimal soil and air humidity: delaying irrigation in this period, even allowing the plants to wilt slightly for 1-2 days, can reduce yield by 12-15%. Therefore, special attention should be paid to providing adequate water during this critical stage.

In our country, maize irrigation is carried out in a differentiated manner, depending on climate, soil-hydrogeological conditions, organizational-economic factors, cultivation purpose (grain or silage), and the biological characteristics of the variety or hybrid. Depending on climate and soil-hydrogeological conditions, maize is irrigated 5-7 times. The irrigation schedule is determined based on the plant's external appearance, physiological indicators, and usually soil moisture content.

When maize is irrigated by drip irrigation, the irrigation rate is reduced but the frequency increases. This is mainly because drip irrigation aims to maintain uniform soil moisture. Another advantage of drip irrigation is the ability to supply mineral fertilizers in liquid form directly to the plants through the irrigation system, which positively affects plant growth and development.

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