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FIGHTING AND PREVENTING SOIL SALINITY IN GREENHOUSES

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Abstract

Soils susceptible to weak salinization need to be somewhat enriched by adding manure and loosening materials - rice husk and straw-cutting, which improve the water-physical properties of the soil. It is unacceptable to water greenhouse plants with water with an increased salt content. Treating seeds with a weak solution of boric acid, 3% table salt, and magnesium sulfate slightly increases plant salt tolerance. Irrigation is often carried out at small rates. In conditions of soil salinity, all technologies should be aimed at the salinization of the upper horizons of soils and the elimination of secondary salinity. It is necessary to periodically conduct soil analysis and monitor the salt content not only in the plowed horizon but also in deeper layers.

Keywords: salinization, greenhouses, drainage, flushing, soil.

Introduction

Soil salinization has a harmful effect on greenhouse vegetable crops, creating an increased osmotic pressure of the soil solution, which reduces the absorption effect of the root system and thereby hinders normal water supply to plants, limits photosynthesis, protein synthesis, and worsens respiration. Tomatoes and cucumbers are especially sensitive to the concentration of soil solution in the first period of growth and development.

With an increased content of chlorine in the soil, its content in leaves increases sharply, while the amount of phosphorus and calcium in plants decreases, and

sodium increases. All this leads to disruption of physiological processes, signs of wilting appear in plants, and they are easily affected by diseases.

The maximum permissible chlorine content in soil for tomatoes with higher salt tolerance is 0,02%, and for cucumbers – 0,007% (relative to absolutely dry soil).

In many greenhouses, there are no horizontal drainage systems, and in greenhouse spaces, vertical drainage systems. High greenhouse temperatures and frequent irrigation contribute to secondary soil salinization. In such conditions, the greenhouse combines of Karakalpakstan, Bukhara, Kashkadarya, Syrdarya, and a number of other regions are operating. Another reason for salinization is the introduction of ballast substances in mineral fertilizers.

To avoid chloride salinization of soils in greenhouses, 40 and 30% potassium salts (a mixture of potassium chloride with sylvinite) should not be used. With each ton of such fertilizer, 200 kg of sodium and 550-680 kg of chlorine are introduced into the greenhouse soil. The maximum permissible concentration of chlorine in the soil is created when applied per 1 ha.
1 ton of sodium chloride. In greenhouses, fertilizers with a large amount of ballast impurities should not be used: simple superphosphate (containing up to 50% gypsum), potassium chloride, potassium salt, sodium chloride, sodium nitrate, etc.

Among nitrogen fertilizers, urea, characterized by its delayed action, should be used for foliar feeding. With a low content of easily digestible calcium in the soil, it is recommended to use calcium nitrate, and with abundant irrigation - ammonium sulfate. Potassium nitrate, which contains 37% potassium and 13% nitrogen, is especially easily absorbed by plants.

From potassium fertilizers, it is advisable to apply potassium sulfate in the form of a diluted solution of 1:500, from phosphorus fertilizers - double superphosphate (with a high content of the active substance).

To replenish the magnesium content in the soil, magnesium sulfate or kalimagnesia is recommended, and magnesium sulfate is used both during the main application and during feeding during the growing season.

Moreover, these fertilizers slightly sour the soil, which is not only harmful but even beneficial for our neutral weakly alkaline soils, as it somewhat neutralizes the carbonate nature of the soil solution. Many nutrients are better absorbed in a slightly acidified solution.

When establishing the nature and degree of salinity, it is necessary to build a good horizontal drainage system, and in many cases, a vertical one, so that during flushing, it is possible to remove all the reserves of harmful water-soluble chlorine and sodium salts at a depth of 1,0 - 1,5 m. Naturally, before flushing the soil of the greenhouse, it is necessary to plow and plan so that uniform heavy irrigation norms (200-300 l/m^2) remove all salts from this horizon. Otherwise, during vegetative irrigation, secondary salinization is possible, which will initially lead to thinning and later to complete plant death.

In greenhouses, it is necessary to strictly monitor the change in nutrient content in the soil during the growing season and apply only those fertilizers that are necessary for obtaining high yields. Excessive amounts of mineral fertilizers are as harmful as their deficiency. Especially, the systematic application of the same type of fertilizer in greenhouses is unacceptable. This disrupts the balance of the soil solution and reduces the mutual neutralization of salts.

Soils susceptible to weak salinization need to be somewhat enriched by adding manure and loosening materials - rice husk and straw-cutting, which improve the water-physical properties of the soil. Loose soil during irrigation dissolves better, and when applied from the surface, loosening materials play the role of a mulch, restraining the rise of groundwater.

It is unacceptable to water greenhouse plants with water with an increased salt content. Treating seeds with a weak solution of boric acid, 3% table salt, and

magnesium sulfate slightly increases plant salt tolerance. Irrigations are often carried out at small rates.

In conditions of soil salinity, tillage of plants is permitted only after thorough irrigation, as otherwise, the rising salts in the upper horizons transfer to the roots of the tilled plants.

In conditions of soil salinization, all technologies should be aimed at the salinization of the upper horizons of soils and the elimination of secondary salinization. It is necessary to periodically conduct soil analysis and monitor the salt content not only in the plowed horizon but also in deeper layers.

Literature

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