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UTILIZATION OF DIATOMACEOUS EARTH IN AGRICULTURAL PRACTICE

Kovaföld felhasználása a mezőgazdaságban

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Diatomaceous earth consist of accumulated skeletons of the perished diatoms sink to the seabed, later getting to the mainland. Its utilisation is various: detoxification, slimming, anti-wrinkle, face wrinkle, skin-, hair- and nail care, industrial filter, but it can be used as natural soil conditioner, too. A series of investigations have been made in order to find the use of the diatomaceous earth in agriculture. These were: 1/ study of the soil conditioning effect; 2/ study of the insecticidal effect; and 3/ study of the stored grain drying effect.

The first experiment deals with the examination of the effect of diatomaceous earth mixed in soil on the quality and quantity of tomato yield under horticultural circumstances. The aim was to determine whether the diatomaceous earth has influence on germination, germ development, time and period of yield maturity, as well as on yield quantity. The results didn't managed to confirm the differentiation of germination ability. However the heights of the germs were significantly higher. The yield maturity period was shorter in the treatments, being more favourable for horticultural producers. Eventually the main result was the purposeful higher yield mass in the treatments. The 150 g kg⁻¹ dose proved to be more efficacy than the 100 g kg⁻¹. As conclusion the utilisation of diatomaceous earth in tomato cultivation may result economic and cultivation advantages.

The second experiment focused on insecticidal effect against the granary weevil (*Sitophilus granarius*) in stored grain. The efficacy was evaluated on maize and barley in laboratory tests at three dose rates of 1‰, 2‰ and 4‰. The treated grains were infested with weevils, the mortality was estimated after 24h, 48h, 7d, 14d and 21d of exposure. After 21 days all weevils were removed and progeny production was assessed 45 days later. The longer exposure intervals increased weevil mortality in both cereal grains. The efficacy on maize was not satisfactory, even at the highest dose rate the mortality was average 20% and the progeny was relative high. On the other hand, 84.99% of weevils were dead on barley, parallel with a complete suppression of progeny. So the utilisation of diatomaceous earth as insecticide may have future in stored product industry.

The aim of the third experiment was to decrease the costs of the grain storage by the utilisation of diatomaceous earth. Three different moisture content maize have been used (19.8%; 21.0%; 28.7%) with 2‰, 4‰ and 8‰ diatomaceous earth percentages. The moisture and dry matter content were determined in accordance to the Hungarian Standard. The moisture contents of the treated grains showed an unambiguous decrease, between 2.3-4.4%. This means 1.5-1.6X higher moisture loss than the control. The higher moisture loss was observable in the case of the 2‰ samples (around 4.5% moisture decrease). The utilisation of diatomaceous earth can't replace the heat transmission grain drying but it can be used for partial drying, as well as can replace the two-step drying by heat with one-step.