

Science created by nature or a future without hazardous residues

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The production of clean, healthy and high-quality fruit and vegetables is becoming increasingly relevant. It is no coincidence that at European level the importance of the issue of residues in produce from various pesticides and fertilizers and their harmful impact on humans and the environment is constantly growing. Restrictions on the use of existing synthetic products are increasing, which raises the risk of development of resistance of pests to them. At the same time, the number of authorized safe products is limited, despite the growing interest in plant-based pesticides.

Plant extracts for pest control in crops have been used since ancient times. Substances synthesized by higher plants that are toxic to pests are often applied in the form of herbal infusions and decoctions for the preparation

of garden sprays. Due to their lower stability in the environment, these products have been displaced by their synthetic analogues. In recent decades, the industry has been working diligently to improve the stability, storability and efficacy of products containing plant-derived extracts. Fortunately, the newly created formulations can successfully compete with other products and be implemented in intensive crop production technologies.

These include products containing:

Nettle extract (*Urtica dioica* and *Urtica urens*) – with nutritive, insecticidal, acaricidal, bactericidal and fungicidal action. It reduces symptoms of iron chlorosis and supports plant growth and development. It can be used preventively for dipping cuttings or for watering after planting – with nutritive and protective effect. The only industrially formulated product on the market is marketed under the trade name Baziktec. It is used as a basic substance in accordance with SANTE/11809/2016. Its use is authorized in apples, plums, peaches, blackcurrants, walnuts, cherries, vineyards, legumes, potatoes, lettuce, cabbage, roses, oilseed rape, radishes, cucumbers, etc. It controls pests such as aphids, psyllids, moths, mites, as well as diseases such as downy mildew, powdery mildew, grey mould, leaf spots, etc. Baziktec is a biodegradable organic product, which excludes the presence of residues in the produce. The dose varies from 100 to 300 ml per 100 l of water. Because of its contact action, it is extremely important to achieve maximum coverage of the plant mass when treating the crop.

Citrus extract – represents a complex of natural organic components such as ascorbic acid, citric acid, bioflavonoids and phytoalexins/furanocoumarin and vitamins. It differs from orange oil in the activity of the formulated products (serum concentrates) and in its penetrating effect in the crop. It provides excellent control of various types of diseases such as *Botrytis* sp., *Fusarium* sp., *Pythium* sp., *Alternaria* sp., *Erwinia* sp., *Xanthomonas* sp. It has a direct fungicidal and bactericidal effect, without residues and without a quarantine period.

Neem extract – a phytoinsecticide acting on insects by direct contact and ingestion. Its systemic action is due to the content of azadirachtin A in the various formulations. When applied foliarly, it penetrates the leaves and moves within the plant, and when applied through drip irrigation systems it is absorbed by the roots and moves to the above-ground parts. There are numerous products on the market with different contents of the active substance, the most concentrated being Oikos.

Pyrethrin extract – a phytoinsecticide from the pyrethroid group. It acts mainly by contact and is characterized by a rapid initial effect against a large number of pests on crops. A proven formulation is Chrisant EC.

Seaweed extract – these products promote the natural stimulation of plants. They improve metabolic processes and water balance, stimulate the natural defence of plants against adverse factors and indirectly affect the access of diseases through the cell wall of the crop. Shigeki contains a high percentage of seaweed extract, rich in vitamins, phytohormones and amino acids. It contains macro- and microelements in a ratio necessary for preparing the crop for critical stages of its development.