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Peak Yields in Cereal Crops and Seed Treatment Technologies

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In recent years, a large part of Syngenta's innovations have been directed precisely towards seed treatment products because they provide a very significant economic contribution to the yield at a considerably low cost and input of active substances.

Syngenta's seed treatment products make an exceptional contribution to sowing density, simultaneous and uniform germination, excellent development of the root system, protection of young plants against pests, and also have an additional economic benefit, which can even be expressed in reducing the number of sprayings during the growing season. It is precisely here that we wish to present three solutions that are exceptionally reliable and profitable. Syngenta's first proposal is the high-tech formulation for wheat seed treatment **Dividend Formula M**, which in recent years has become very successfully established in Bulgaria. The feedback on it is excellent, and

this is due to its efficacy and characteristics: Dividend Formula M is a new generation wheat seed treatment product and represents a high-tech water-based formulation, which provides multiple advantages. **First**, the systemic and contact action of Dividend Formula M and the characteristics of the formulation provide definitive control of disease pathogens on the seed surface, inside the seed, and in the soil around the sown seed. **Second**, comparative studies on the level of disease control categorically show that Dividend Formula M provides higher control of Fusarium, Septoria, and Smut compared to the standards in wheat seed treatment. Also, Dividend Formula M stimulates faster emergence and contributes to even and uniform emergence of healthy plants. **Third**, the improved characteristics of the formulation (because it is water-based) of Dividend Formula M provide multiple additional advantages for agricultural producers and professionals engaged in seed treatment - excellent and lasting adhesion of the product on the treated grain is guaranteed, which ensures a top effect even under high infectious pressure from soil- or seed-borne pathogens, and uncompromising action even under extreme crop growing conditions. With Dividend Formula M, farmers can operate freely without dusting, avoiding the concern of residual product quantities in the bags. And very importantly - the perfect consistency of the formulation with Formula M technology ensures an average of 15% higher throughput of the seed treatment line through faster and more uniform flow of treated seeds and the use of less water during treatment; cleaning the equipment is significantly easier, and changing the product on the line is considerably faster; packaging and unpackaging are much cleaner.

In 2015, a hit in cereal seed treatment became Syngenta's Celest Top. **Celest Top is a broad-spectrum insecticide fungicide and stimulant for seed treatment of wheat and barley against diseases and pests simultaneously.** Celest Top is distinguished by including three active substances with three different modes of action, has complex insecticidal and long-lasting fungicidal action, and protects not only the seeds and sprouts but also the young plant. Celest Top is Syngenta's proposal for top yields, which Syngenta recommends for earlier sowings, seed production, monoculture production, and under stressful conditions of various natures such as drought, low pH, soil salinity, temperature stress, toxic aluminum levels, virus attacks.

For the autumn of 2016, Syngenta is also presenting a new seed treatment product – Maxim Star. Maxim Star is a two-component fungicide for cereal seed treatment for controlling diseases on the seed surface, inside them, and in the soil around the sown seed. **Maxim Star is distinguished by an exceptionally broad spectrum of controlled diseases, long-lasting action, and very high efficacy in controlling Fusarium root rot, Leaf Stripe, and Smut.** Precisely the breadth of the spectrum of registered controlled diseases, which is a guarantee of effective control with economic benefit, will make Maxim Star one of the main products in the choice of Bulgarian farmers in the future. Maxim Star controls ***in winter and spring wheat***: fusarium root rot (Fusarium spp.), helminthosporiosis (Cochliobolus sativus), snow mold (Monographella nivalis), glume blotch (Septoria nodorum), common bunt (Tilletia caries), loose smut (Ustilago tritici) at a dose of 100-150 ml / 100 kg seeds; in winter and spring barley: fusarium root rot (Fusarium spp.), snow mold (Monographella nivalis), leaf stripe (Helminthosporium gramineum), net blotch (Pyrenophora graminea / Pyrenophora teres), covered smut (Ustilago hordei), loose smut (Ustilago nuda) at a dose of 150-200 ml / 100

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kg seeds; ***in oats:*** fusarium root rot (Fusarium spp.) and loose smut (Ustilago avenae) at a dose of 150-200 ml / 100 kg seeds.

About 30% of Fusarium manifestations on the ear are due to systemic infection from the soil; losses from uncontrolled Fusarium average about 25% of the yield but can reach up to 50%. Leaf stripe, on the other hand, can reduce the number of ears by up to 15%, the amount of grain per ear by up to 20%, and in an epiphytotic course of the disease, the yield can drop by up to 50%. According to Syngenta, Maxim Star is an exceptionally reliable solution for treating malting and feed barley seed due to providing excellent protection against Leaf Stripe, Fusarium root rot, and Loose smut on barley. The efficacy of Maxim Star against these diseases is impressive. However, the product should not be perceived as intended exclusively for barley – Maxim Star also gives excellent results on wheat. Maxim Star contributes to very good crop establishment and increases yield and product quality thanks to: two different modes of action and elimination of the risk of resistance development; providing protective, curative, and eradicative action; long-lasting action; the very good synergy of excellent systemic action in the plant, excellent contact-penetrating action for protection against diseases on the seed surface and control of disease pathogens in the soil around the sown seed. Maxim Star also has a strengthening effect on the development of the root system and the plant habit, is very suitable for late sowings, and excellently protects the seed, young roots, as well as the coleoptile during its development in the soil (the coleoptile is the pointed protective sheath covering the sprout - the organ responsible for breaking through to the surface). Precisely the reliable protection of the coleoptile is a prerequisite for the excellent crop establishment.

Syngenta also offers a further expansion of the technology – agricultural producers can purchase Dividend Formula M and Maxim Star individually, but also in very advantageous packages with Vuxal Terios - the German suspension of microelements with copper, manganese, molybdenum, and zinc. The addition of Vuxal Terios aims to ensure normal nutrition of the young plant in the early stages of development when the root system is young and still in the initial development stages. Vuxal Terios has been proven to increase germination, ensures better root development (contains phosphorus), enhances resistance to herbicides and adverse climatic conditions - plant development is faster and plants prepare better for successful overwintering; in spring, the crop develops earlier and uses the still available soil moisture more effectively during yield formation.

PR material