

Creation and Introduction of Highly Effective Ecologically Safe Regulators of Plants Growth for Increase of Productivity and Quality of Agricultural Crops.

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Kazakhstan is the agrarian country but in spite of the fact that in agriculture have been engaged for a long time, still there are unresolved the problems connected with increase of efficiency, increase of stability to environmental conditions, weeds, illnesses, insects. In process of an intensification of cultivation of grain crops there is a necessity of application of great volumes of protection frames that leads to considerable rise in price of production.

One of the perspective ways of providing increase of efficiency is application of regulators of growth of plants (RPG). Kazakhstan being in great need in preparations of different function for plant growing, them now does not make, and import. RPG to Kazakhstan are delivered from 14 countries of the world. Among the CIS countries are the Russian Federation and Ukraine. A constancy of deliveries Ukraine, Germany, Switzerland shown by the Russian Federation. For six years to Kazakhstan 1272 tons PPP, on the average on 212 tons per year are delivered. In 2011, only France has delivered to our country 353 tons of plant growth regulators. Import also stably grows in dollar expression and for last 3 years growth averages 71 %, and in total expression - on the average on 37 % annually. As a whole, market RPG probably one most fast-growing markets in Kazakhstan. The data cited above specifies in perspectives of researches in the field.

Kazakhstan, being the agrarian country, and being in great need in preparations of different function for plant growing, now does not make them, and import. In Kazakhstan 14 regulators of plants growth are brought in the list resolved for application in agriculture of pesticides (weed and pest-killer chemicals) only. Over them only 3 are domestic, but have passed only a registration stage on vegetable cultures and are not finished to application (because of not adaptability to manufacture, i.e. complexity of reception). Though, Kazakhstan is the important exporter of grain in the international market and sown area of grain crops occupies over 80 % (16.5 million hectare of 21.5 million hectare) of area under agriculture crops are not present any resolved to application in Kazakhstan a domestic regulator of plants growth for grain crops.

Therefore, creation of original domestic preparations of plants protection raising productivity of crops and improving quality plant-producing of production, and also working out and introduction of low-cost-based and highly effective new technologies on their creation acquires a special actuality.

For realization of this problem, using a technique of thin organic synthesis, combinatory synthesis by a variation of an aromatic radical and quaternizing tertiary atom of nitrogen piperidine rings of the agent are synthesized for the first time by us 12 new acetylene piperidols of ZhOT series. By screening of their water-soluble forms, on wheat and barley seeds preparations ZhOT-4 and 7, surpassing in biometric parameters as control, and standards – known phytohormones, as heteroauxin, BAP (6-benzilaminopurin) to 30 % for the further tests for increase of productivity, acceleration of growth and wheat and barley development are selected.

Spent profound laboratory and demonstration (finely plot) comparative tests ZhOT-4 and 7 on grain (wheat and barley), vegetable (potatoes, carrots, cabbage, cucumbers, tomato) and other cultures have shown high efficiency of application of new synthesized preparations ZhOT -4 and 7

which exceeded indicators of the resolved to application in Kazakhstan a known reference preparation – "Agrostimulin" (Ukraine).

Currently, our products are tested for growing of seedlings of grapes. Now we also work in the field of preservation of the environment. Preparations ZhOT-4 and 7 have been tested on germination, growth and development of seeds of a Tien Shan fur-tree (*Picea schrenkiana*) in KazSRI protection also quarantine of plants and the Ile-Alatau state national natural park. The conducted laboratory and field tests have shown that new preparations stimulate growth and development of organs (needles, a crone, a stalk) Tien Shan fur-trees *Picea schrenkiana*. The air-dry weight of an elevated part of seedling in a skilled variant also exceeded control (on 19 %) and has provided 98 % seeds germination.

Competitive advantage is high efficiency, a wide spectrum of cultures, good solubility in water, a low dose of application – 0.0001 % on operating substance (1g per 1t of water) or 13-50 mg on hectare, comparable with natural phytohormones, long periods of storage, safety.

Manufacturability is a high exit of target products, consecutive carrying out of 3-stages of reaction in one reactor.

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