Organic fertilizer based on basic potassium humate and their prospects

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In modern conditions in Kazakhstan the development of ornamental plant breeding is noted, the need for ornamental plant species has increased, the work with the range of ornamental crops resistant to abiotic and biotic factors is strengthened. The latter includes the use of fertilizers of organic origin "Kazuglegumus" with regard to the needs and biology of a particular species. Research is carried out by scientists of the "Institute of Coal Chemistry and Technology" LLP and Kazakh Agrotechnical University named after S. Seifullin together with producers of the preparation "SPA "Kaztechnougol" LLP during last three years. The preparation was used for treatment of planting material and root treatment during plant vegetation, Kazuglegumus fertilizer was produced by non-thermal method, by cold synthesis method by electrophysical effect, from oxidized coal of Maikuben basin. The base component of the obtained humate contains the following micro and macroelements presented in table 1. The use of humate increases immunity and stress resistance, adaptive properties and enhances the physiological mechanisms of plant protection against harmful organisms.

Table 1. Content of macro and micro elements in "Kazuglegumus"

Name of the preparation	C, %	H, %	N, %	S, %	O, %	K, %	P, %	Mg, %	Humic substances content, %
Kazuglegumus (Potassium humate)	22.21	1.90	3.5	0.68	20.44	9,16	0,01	0,24	56

The objects of the experiment are all groups of ornamental crops: trees, shrubs, perennials and annuals in open ground and plants in closed ground. When growing seedlings of flower crops, for example, zinnia (*Zinnia*): the studied drug was used as a root top dressing to enhance the growth of biomass, obtain a large leaf surface and large buds and a stable stem mass (Fig. 1). With the same planting dates, the seedlings treated with humate in terms of biomass and constitutional parameters were an order of magnitude higher than the control variant.

Figure 1. Growth and development of seedlings of zinnia (*Zinnia*): a) using basic humate; b) control.

Figure 2. a) mandarin plant (*Citrus reticulata*) damaged by the pest mealybug to the loss of leaf surface up to 80%; b) plant restored when feeding with basic humate and diatomite treatment.

Optimum results are shown by the use of basic humate in combination with diatomaceous earth for plant recovery after active damage by a pest, for example, mandarin (*Citrus reticulata*) (Fig. 2). Thus, the basic humate "Kazuglegumus" shows itself as a promising, multifactorial organic preparation for use in agricultural technology and the protection of the previously listed groups of ornamental crops.

References:

1. Д.Т. Конысбаева, В.С. Горбуля, М.Т. Мырзабаева Вредители и болезни распространенных декоративных культур/ Нур-Султан: НАО КАТУ им.С. Сейфуллина, 2021.-192с.