

ENVIRONMENTALLY SAFE AND RESOURCE SAVING TECHNOLOGIES AS A METHOD OF INCREASING OF OIL CROP PRODUCTION COMPETITIVENESS

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Insufficient management of land of agricultural purpose, which have seen recently, leads to worsening of the quality structure of the soil, its degradation and reduction of fertility. Common thing was a short-term lease of land and growing monocrops such as sunflower during several years together (planted area under sunflower grew by 3.2 times from 1990 to 2012 (from 1636 ha to 5194 ha). Ukraine has taken the first place in the world since 2009 by the amount of production of sunflower seeds. 20% of the world acreage under sunflower crops is concentrated in the country. However, yielding capacity of oil crops in Ukraine is much lower than in European countries. The causes of low productivity are inobservance of basic requirements of crop rotation and technology of crop planting as well as slight attention to hybrid selection and quality of seeds.

Traditional crop rotation is broken in many farms. Specific amount of sunflower in the acreage under crops exceeds 30%. (Scientifically-based saturation standards of rotation should be in the range from 0.5% in Polissia region to 15% in Southern Steppe region). This leads to the fact that sunflower is grown in the same field after sunflower in 2-3 years which is not acceptable. Such oversaturation of crop rotation with sunflower, especially in farms with small-acreage, where a set of crops is reduced, the use of specialized short-term crop rotation, sowing with non-dipped seeds, other technological breaking in growing leads to worsening of phytosanitary state of crops of this plant, promotes deep drying of soil, decrease of fertility and accumulation of infection pathogens in soil, on plant leavings and infected shoots of drops.

Scientific principles of the rotation structure include proper selection of precursors and the optimum combination of the crops of the same species with keeping of admissible periodicity of their return to the same field. Such rotation structure primarily performs a basic biological function as phytosanitary and allows reducing the amount of used pesticides. Allowable ratios of periodicity to return crops to their previous growing area for sunflower is not earlier than in seven years, rape and soybeans are not earlier than in three years. Today, farms do not provide ecological and economic assessment of crop rotation and do not pay any penal sanctions for lack of crop rotation projects and keeping proper conditions of land use.

Traditional technology for crops growing requires too much fuel and human labor, which in modern conditions is unacceptable from both an economic and environmental point of view. In these circumstances, using of resource saving technologies is a question of urgent importance. Saving agriculture is preserving of the soil as a living ecosystem that has developed in its natural state before human intrusion, with increase of organic

matter in the soil. Soil fertility has to be increased after getting every harvest of crops and yielding capacity of the following crops has not been grown at the expense of applying fertilizers in additional quantities but by increasing of soil fertility. It is possible to achieve such result by using modern system of agriculture as No-till.

Applying of agricultural system as No-till promotes returning the soil to its previous natural condition without any using of mechanical tillage. Today, this agricultural system is used in the area of 124 million hectares in global agrarian sector. They are mainly the countries which take leading positions in the production of agricultural products, such as Canada, the USA, Brazil, Argentina, Australia and others. Brazil made production of grain crops twice bigger during the period from 1991 to 2004, while the area was increased only by 9%. This increase happened with the use of No-till system. Results show that it is possible to get benefit in economy, social sphere and environmental protection by using this system. Economic advantages consist in reduction of charges on growing due to reduction to the amount of technological operations during growing of agricultural cultures. The productivity here can be at that level that turns out after traditional to technology, but a profit grows through less charges. Ecological advantages are this increase of content and improvement of balance of organic substance and moisture in soil, maintenance of structure of soil, reduction of threat to erosion. In accordance with her must change and system of agriculture side reduction to labour intensiveness of unit of mineout products at a simultaneous increase her general amount. Accordingly social advantages this reduction of business hours, employment, creation of possibilities for people to take up other businesses.

Basic principles of soil saving agriculture are the same for different regions and climatic zones:

- applying of subsurface tillage by keeping crop leavings and chopped straw on the soil surface;
- use of crop rotations that include marketable crops and crops that improve soil fertility;
- optimal proportion of agrarian and technical, chemical and biological methods to protect agricultural crops from weeds, diseases and pests;
- use of qualitative seeds.

No-till system is often defined as a production system with minimal breaking of the soil surface. It allows producing more crops by lower cost of soil and water, fertilizers, pesticides, energy sources and labor. In addition, environmental aspect is quite important because constant use of No-till system allows restore soil fertility, stop erosion; reduce emissions of carbon dioxide into the atmosphere. Production expenses and production costs are reduced by refusing from the mechanical tillage, and therefore, its competitiveness is increased.

Summarizing, it is necessary to say that production of competitive products of oil crops can be possible only on the basis of constantly growing crops, by optimal proportion

of crops in crop rotation and by using of new resource saving technologies for growing crops.

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