

*Waterdrive*

 **Interreg**  
Baltic Sea Region



EUROPEAN  
REGIONAL  
DEVELOPMENT  
FUND



WITH THE FINANCIAL  
SUPPORT OF THE  
RUSSIAN FEDERATION

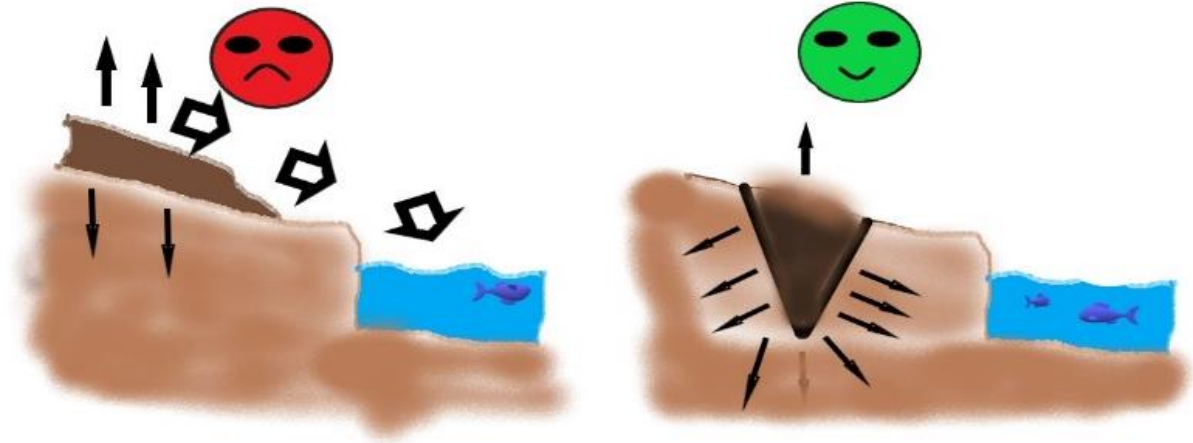
*«In-Furrow Subsoil Application of a Liquid Organic Fertiliser  
under Pressure».*

*Vasilev Eduard,*

*Federal Scientific Agriengineering Centre VIM, St. Petersburg, Russia*

## Ingress

In-furrow subsoil application of a liquid organic manure-based fertiliser under pressure is a measure aimed at reducing the time of contact between fertilisers and the open air and at their immediate spread in the root zone within the plow layer. The spread of fertilisers within the soil helps accelerate its infiltration and the binding of nutrients through microbiological processes, which substantially reduces the risk of their surface runoff to ground waters and surface water bodies, while cutting gas emissions (of ammonia, hydrogen sulfide etc.) to the atmosphere.



## Restraints

Restraints include high stoniness of soil, since stones can damage the implements, and fields with steep slopes, which can topple the application equipment. Moreover, when slopes are steep, liquid organic fertilisers will not get absorbed through the soil fast enough, leading to surface runoff.

Natural and climatic restraints are as follows:

- sub-zero air temperatures, since the fertiliser can freeze;
- high solar radiation, since the fertiliser can evaporate to a greater extent than seep through the soil, which increases emissions to the atmospheric air (this effect is less apparent in the case of this method compared to surface application);
- abundant rainfall and waterlogged soil, since the speed of infiltration of liquid fertilisers goes down and they can drain away to water bodies together with rainwater.

The implements used to form the furrows commonly include a disc (one or two), different types of cultivators (duck foot blades etc.). To make the method more effective, rollers can be used to cover the furrows after placement



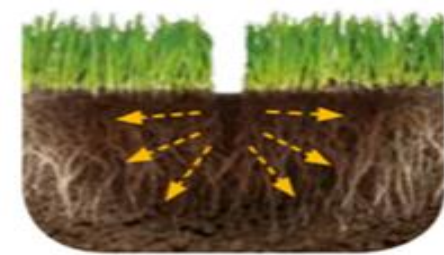
Original view



Sharp cut



Fertiliser application



Infiltration

## *Effects, duration and maintenance*

A faster nutrient uptake by plants and soil, coupled with the prevention of surface runoff, reduces nitrogen emissions and escape of phosphorus into water bodies. The main potential of subsoil application is enhancing capability and cutting emissions.

Major investment costs for implementing this method are related to the purchase of a tractor and a fertiliser application machine. Depending on the manufacturer, performance and lifting capacity of the type of the implements used, average unit prices in Russia vary from EUR 25,000 to 130,000 and higher. The mean service life established by the manufacturer is up to 10 years, and annual expenses generally comprise operational expenses, notably on repair and maintenance of equipment, payroll, fuel etc.



*Waterdrive*

 **Interreg**  
Baltic Sea Region



EUROPEAN  
REGIONAL  
DEVELOPMENT  
FUND



WITH THE FINANCIAL  
SUPPORT OF THE  
RUSSIAN FEDERATION



*Institute for Engineering and Environmental Problems  
in Agricultural Production –  
branch of Federal State Budgetary Scientific Institution  
“Federal Scientific Agroengineering Center VIM”  
(IEEP – branch of FSAC VIM)  
St. Petersburg, Russia  
e-mail: [sznii6@yandex.ru](mailto:sznii6@yandex.ru)*