

## HOW A RUSSIAN FARMER SAVED 2.5 MILLION RUB [about US\$ 40,000]

### Resource-saving technologies in areas of risky farming



In order to improve profits, farmers have to look for new ways of reducing expenses. They need to make informed decisions, based on advances in modern technology

A trial conducted on the farm "Polevoe", LLC, situated in the south part of the Volgograd Province resulted in an impressive cost saving by using new technologies. Volgograd Province is recognized as a region of challenging conditions for crop production. Low precipitation in this region is very similar to the dry steppe zone of Kazakhstan. Rainfall varies from month to month during the year. Often drought conditions are

experienced during the growing season and, typically, most precipitation occurs in late summer and during the autumn harvest.

Sergey Kazhgaliev, is a well-known farmer in the region with 30 years of farming experience. He is a progressive farmer always looking for resource-saving techniques. Sergey's efforts have enabled him to achieve outstanding and sound agricultural results. In 2006, his company (Polevoe) received the honorary title – "Company of Top Level Farming". Whereas, in 2010 the Ministry of Agriculture awarded the farm with the distinction of "Top level production of agricultural crops".

Sergey Kazhgaliev grows the following crops: spring wheat, sunflower, false flax, corn and sorghum. The total area farmed is 9,700 hectares [24,250 acres]. In 2010, in part, as a means of reducing total production costs, he started practicing no-till farming (direct sowing).

The main limiting factor to crop production in the area is precipitation (moisture availability during the growing season). In order to retain more water in the soil, Sergey has practiced organic mulching – creating an "organic blanket" on the soil surface. This helps to limit the loss of soil moisture; however, a further problem is preserving water inside the plant itself. Dry windstorms cause high rates of transpiration (water loss from the plants) which can largely negated his water conservation efforts and led to reduced crop yields and lower production quality.

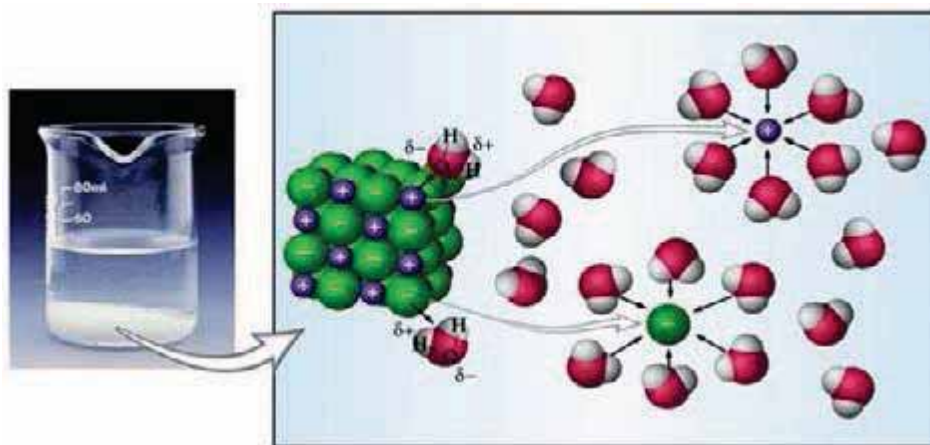
Having read an article titled "Saving water technology inside the plants", written by AgroPlus, LLC. Sergey developed a new appreciation for water's characteristics. The article suggests that creating a colloidal water structure in a plant's tissue increases the plant's dry matter content which in turn increases the plant's resistance to drought. The article indicated that the technology to increase plant dry matter content is available through AgroPlus.

Explanation: water in plant cells is present in two forms: 1) free flowing and 2) colloidal form (condensed with high dry matter content).

Free Flowing Water: Advantages: it moves easily to take part in different bio-chemical processes. Disadvantages: turns into crystals, freezes and evaporates very quickly.

Colloidal Water: is also readily available for bio-chemical processes, but has a lower freezing point and a slower evaporation rate. The higher the dry matter content the higher the plant resistance to drought, diseases and pests. With higher dry matter content, crop yield is increased.

Understanding the importance of not just preserving moisture in soil but also water in the plants, Sergey began studying and implementing new techniques (including the technology from AgroPlus) in his fields. Correct fertilizer application of Raykat Start for seed treatment, as well as leaf applications of Atlante, Atlante Plus, Kelik K and Kelik K-Si (according to the diagnostics results) raised the dry matter content and helped to store more water in the plants.



As a result of these initiatives, Sergey's farm achieved yields 30-40% higher than his neighbors. Today, Sergey's field produce yields that are 1.5 – 2 times higher than other farms in this region.

Water Quality It is well known that when you practice minimal till (or no-till) farming practices, the most frequent agronomic problems encountered are disease control, pest management and preventing weeds. The effectiveness of glyphosate (a commonly used herbicide) is reduced in dry climatic conditions – resulting in farmers increasing their glyphosate application rates by up to three (3) times the normal (prescribed) application rate. Besides having to resort to such a high application rate of glyphosate and the problem of an increase in glyphosate-resistant weeds, the quality of the spray water used with farm chemicals can be problematic! In preparing any agricultural chemical spraying solution it is necessary to mix the chemical (active ingredient) with water. As a result, in virtually all herbicide applications, the makeup of the resulting solution is essentially 99% water. Hence the importance of having good quality water. Water in this region is typically hard (high in calcium and magnesium). Hard water is in itself harmful for plants as induces salt stress. As a general rule, the higher the quality of spray water used, the more effective the results of the herbicide (or pesticide) treatment (and the less stressful for plants)! But how does one improve the water?

Fortunately, through Sergey's research he became aware of the AquaKat Technology.



## The AquaKat Water Solution

The AquaKat revitalizes the water so that minerals no longer bind to the glyphosate molecules (or to other chemicals). The AquaKat changes the water in such a way that the water molecules create small cluster structures – hexahedrons (like snowflakes) in combination with the active ingredient of glyphosate. These small water clusters transport the active ingredient into the plant's metabolic system, which has the effect of making the herbicide application more effective. By improving water quality, the AquaKat technology helps to control production costs, by:

- Reducing pesticide/herbicide application rates by up to 50%
- Reducing water requirements in field spraying application by up to 50%

In order to conduct some trials, Sergey purchased two AquaKat XLs – from AgroPlus [The AquaKat is produced by Pernergetic Int. AG, of Switzerland] – and installed them on his sprayers. Being conservative in his approach to this new technology he began by just slowly to reduce his glyphosate application rate. He started with a 15-20% reduction, then increased to a 30% reduction. Field inspection revealed that structured water created by the AquaKat improved the effect of the glyphosate (even at reduced application rates). Impressed by these results, he lowered the herbicide's application rate to 50%. Even at a 50% reduction he found that the results achieved were impressive. This success convinced him to make 100% of the AquaKat on his field sprayers on his entire land holdings. He calculated the result was a saving of an estimated 2.5 million RUB [US\$40,000] on herbicide costs in one season!



*AquaKat installation. AquaKat is easy to install, just attach it to the main boom (pipe).*

### Advantages of AquaKat treated water:

- Dissolves fertilizer and pesticide products better
- Stabilizes the spray solution
- Water adheres to leaf surfaces
- The applied solution penetrates better into the tissue of the leaves (chelating effect)

In this dry region of Volgograd Province, water-conserving techniques, including using the AquaKat technology – to improve water quality have an important role to play. Based on Sergey's results, he is keen to share his positive experience with other farmers and agronomists. Some farmers from Volgograd Province (and Kazakhstan) have already expressed an interest in adopting this technology on their own farms. Next year we will be in a position to share with you the results of their experiences.

For more results with these technologies we welcome you all to visit our booth K118 in the Congress-Hall at the exhibition "KazAgro-2015", which will take place in the Astana Exhibition Center "Korme" 27-29 of October.

