

Experience of a vegetable farm with colloidal plant nutrition

### Is silver in nano range worth gold?

It has now been almost exactly six years since the vegetable producer Rainer Wild first came into contact with colloidal plant nutrition - a concept based on the use of metals in the nano / picoparticle range. Silver, copper, iron and others are added to the plants as fertilizers with the aim of making them vital and strong. Due to the very small particle size, these trace elements are able to penetrate the plant better and increase the uptake of nutrients.

“I have to honestly say that I made it relatively easy for the seller who was standing in my yard. I had known about colloidal silver for many years and had already used it myself. Silver is said to be effective against all kinds of bacteria, fungi and viruses, it can be bought at any pharmacy and it is widely used in alternative human and veterinary medicine. So, I thought, it won't hurt my parsley either”, says Rainer Wild with a laugh, whose company is located near Ludwigsburg, Baden-Württemberg. His main crops include flat and curly parsley and chives (potted). Most of his herbs grow outdoors, only the potted chives

grow all year round in a 300 m<sup>2</sup> greenhouse.

#### It seems the parsley is so green

Out of pure curiosity, he first tested the colloidal silver on parsley as a horticulturalist. “If people use it as a food supplement, then not so much can happen in terms of horticulture. So, I just tried it out on the running season. After around eight days, the employees starting to ask me what was happening with the parsley, it glowed so bright green”, the vegetable farmer remembers. It seems that this effect is due to the silver, as it is supposed to cause a so-called “light scattering effect” on and in the leaves. The light is deflected, similar to a disco ball. This illuminates the plants cells more intensively. A higher proportion of daylight, presumably also the exposure in the greenhouses, contribute to the assimilation process. This creates more chlorophyll, which also accelerates growth. In addition to colloidal silver, copper, iron, boron, and calcium together with silicon, are also used, all in sizes ranging from nano to pico.

Since these elements are approved as fertilizers, they can be used as such. However, it is not necessary to take them into account when determining the fertilizer requirement, as they do not administer nitrogen or phosphorus and the quantities applied are very low at just a few grams per hectare per year.

#### Expanding practical experience

While in the greenhouse the agents are usually administered via irrigation, Rainer Wild relies on the crop protection sprayer outdoors. “Silver, copper and the others are used almost every week until shortly before harvest. Parsley and chives usually take four to six weeks to reach their next cutting time. During this time, I only hold off in the first week before starting to spray”, explains the horticulturalist.

Based on his experience with colloidal plant nutrition, he has gradually reduced the use of fungicides since 2019 and even stopped using them completely in 2020. “Colleagues who do not want to abandon chemical fungicides entirely, for example, can only use the colloidal fertilizers every 14 days and probably still save half of the usual use of pesticides. However, I believe that each colleague should have his own experience”, emphasizes Wild. Mixtures are in principle possible. However, when using pesticides at the same time, it is important to note that silver should not be mixed with sulfur or other pesticides containing sulfur, for example, due to the formation of sulfur as sulfate, a water-insoluble salt that it is no longer available to plants in this form. If you want to be sure which mixtures are possible, you can get advice from the respective manufacturers of the colloidal fertilizers. For Rainer Wild, they are definitely the future, especially in view of the political decisions to further reduce the pesticide use. “Colloidal silver, copper and other products have become trend-setting and indispensable companions on my horticultural journey”.

Julia Appel



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 **INTERVIEW**

Interview with Rainer Wild, vegetable producer from Markgröningen

## Savings on every corner

Rainer Wild has been gaining experience with colloidal plant nutrition on his own farm for six years. He himself relies on products from B + H Solutions from Remshalden. The vegetable producer now also advises companies on questions about colloidal silver, copper and others.

»Gemüse«: New alternative concepts on fertilization and fortification sound promising. Is there a way to quantify the results of their use?

Rainer Wild: This is a very special story now. Because I had very good experiences in 2019, after bacteria completely destroyed my first parsley harvest during a very wet spring, the head of B + H Solutions, Elmar Buder, advised me to not only use silver but the entire concept, thus, I was able to achieve several subsequent harvests with the best quality. He also encouraged me to cut down on fungicides. So, in 2019, I only used Ortiva, Score and also Askon, which is a mixture of the other two. By doing so, I successfully reduced my range of active ingredients from four to two. This allowed us to omit problematic active ingredients that were detected in the harvested product for several months - even during the winter of the following year. Elmar Buder also informed me that in large greenhouse systems with tomatoes,

cucumbers, peppers, and also in greenhouse strawberries, there is no need for phytosanitary protection for the plants. If fungicides are no longer needed there, the used beneficial insects should be able to work better. The biological equilibrium tends to remain in balance. Therefore, greenhouse colleagues should also be able to save insecticides completely in many cases. That drew me to test more outdoors and explore limits. Thus, in 2020, I completely eliminated the use of fungicides in my outdoor crops. During that time, of course, I was always on the lookout to see if something was “getting out of control”. Our cultivation advisor confirmed that there were significantly more ladybugs and other beneficial insects in our fields. We attribute this to the complete withdrawal of fungicides.

»Gemüse«: What about the fungal infestation after the complete omission?

Rainer Wild: In the summer there was a slight infestation with *Septoria* but so little that it was actually negligible at the harvest. It could be seen that mostly only the lower, older leaves were slightly affected, the larger ones were not. Afterwards, I only sprayed during the cool morning hours and with a wetting agent, so the silver and others could also be better absorbed. That



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stopped the spread and *Septoria* practically no longer occurred in the subsequent productions. Downy mildew and powdery mildew also did not occur during the entire season, and there was no rust in the chives in autumn either. In terms of plant protection, 2020 was generally an “easy-care” year. We will continue on this path in the coming year and see how it works when there is a higher pressure of infestation. If necessary, we can use additional standard chemical treatments on a case-by-case basis.

»Gemüse«: When were the first signs of success apparent?

Rainer Wild: Immediately after a week

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when our employees admired the “greener color” of the parsley. In 2019, despite the failure of the entire first parsley round due to bacteriosis, after using the full concept from the second production onwards, we had our best horticultural year. In 2020 we completely ceased the use of fungicides and were able to deliver enough goods with Edeka and Kaufland quality every day. There were no significant losses. The results of our laboratory tests showed that no fungicides were used. From our point of view, the possible reduction to the total abandonment of fungicides (in greenhouse systems) is an essential feature of colloidal plant nutrition. I also see this as an important step in the further development of horticultural production processes. We all know about the decisions to reduce crop protection products in the coming years. We do not yet know what resources are going to be cut or limited. It is possible that the corporations may see the maximum amount of active ingredients allowed even more limited.

»Gemüse«: Residues in the final products are always a big issue in society. How does it look here? Do you expect residue problems as a company?  
Rainer Wild: No. I had the silver and

copper content examined in the laboratory at the wholesale market. Silver was barely reaching the detection limit, copper too. By the way, silver is not registered as a “pollutant” anywhere in the world. It’s just a natural element. Depending on the amount, copper is considered a pollutant. But it is also an essential nutrient, we must not forget that. As described above, the nano- and even pico-finely-ground-elements are much more effective because, due to their larger surface area, they can release more ions and are therefore noticeably more reactive. Like our greenhouse colleagues, we administer them outdoors: one gram of silver and half a gram of copper per hectare and treatment. That is unimaginably little and really only as “nutritional supplements”. We only use about a thousandth of the recommended amount of copper of up to 4 kg per hectare in a year. With this, it is impossible for any excess of heavy metals to accumulate in the cultivation soils.

»Gemüse«: Colloidal plant nutrition seems predestined for organic farming. Are these products approved for organic agriculture?

Rainer Wild: Unfortunately, no. I do not understand that either. On the one hand you can buy colloidal silver at any

pharmacy and the end consumers even take it pure as a nutritional supplement, on the other, FiBL rejects its approval because the organic associations are fundamentally opposed to “nanotechnology”.

»Gemüse«: The effect is one thing. It has to be financially manageable. What benchmark should a company expect with these products?

Rainer Wild: The number of applications is different for each crop. It also depends on whether you only want to use the silver and copper, the two main elements, then it can get to around 50 euros per hectare and application. If boron, iron and calcium are also used, a few euros are added. Two to four applications are expected in most crops. I have heard that greenhouse operations with year-round crops usually use the entire program and can thus save on much more expensive iron chelates, for example, as well as on boron and calcium fertilizers. The use and fertilization costs with the B+H products should be practically the same in a greenhouse operation as in the field. There, it is administered via irrigation. Savings in chemical plant protection can offset.

Interview conducted by Julia Appel.