

POTATOES

The potato plant belongs to the family *Solanaceae*. There are over 150 species in the *Solanum* family of tuber-bearing species, including potatoes. It is believed that the potato originates from the Andes (Peru and Bolivia). Potatoes are among the most important plants that are used in feeding both people and livestock. The Potato plant grows 50-100 cm high and the leaves are 20-30 cm long. The root is a continuation of the over ground stem. The end of the roots can easily thicken and shape several tubers (up to twenty) different sizes and shapes. The Spanish moved potatoes from South America to Europe in the second half of the 16 century. In the 17th and 18th century, potatoes spread throughout Europe and became the main agricultural culture in Ireland, Germany and the countries of Central Europe. Potatoes are one of the most important plants in human nutrition; potato tubers are very nutritious and easily digestible. Contain large amounts of vitamin C, various amino acids, proteins, tiamin and nicotinic acid.



Solanum tuberosum

Ecological conditions of growing potatoes

Potatoes are grown for tuber, which is used for human consumption, for feeding livestock and for industrial purposes. Potato is grown on very large areas in the world, in temperate climate. Potato culture also grows up to an altitude of 1000 meters, in the Andes and even more. In the subtropical area potatoes are grown as winter crops.

The Potato plant requires good soil preparation and adequate fertilizer before planting. The best potatoes are grown on lighter, drained soils, but the potato culture is not very demanding on the quality of the soil.

Potatoes require good fertilization, especially if the soil is poorly fertile. So for successful cultivation of potatoes soil should be well prepared regarding fertilizers, especially organic fertilizers (stable mature manure, compost, green manure), which, among other things, significantly improve the fertility, texture and soil structure.

For fertilization with organic manure usually certain amounts of mineral fertilizers are added, this is unnecessary if Zeogrow is used. Previous experience has shown that Zeogrow can fully compensate for fertilization with mineral fertilizers, especially where fertilization was performed with the necessary quantities of manure.

The Potato culture is prone to many diseases (bacteria, fungi, and viruses), parasites and pests. More than 200 kinds of diseases have been recorded that attack the plant during the vegetation period. Just to mention potato rootworm (*Leptinotarsa decemlineata*) whose larvae, as well as the adult insect can completely destroy the potato leaf, and thus the whole plant.

Economic importance and geographical distribution of potato crop

The Potato is important because it can be grown almost anywhere, The potato is grown in many countries (over 150) and on all continents. Worldwide production of potatoes in 2007 amounted to 333.5 million tons produced on 18.8 million hectares. On average 17- 23 tonnes per hectare.

Potato occupies the fifth place in the world by volume manufacture (after sugar cane, corn, rice and wheat.)

The world's biggest potato producers are China (64.8 Mt), Russia (36.8Mt), India (28.6 Mt), USA (20.4Mt) and Ukraine (19.0 Mt). Productions of these countries represent half of the world production



Figure 1. - The picture is taken in full bloom development of potato plants. Treated plants with ZEOGROW are strong and resistant to disease owing to the influence of ZEOGROW that increases the immunity of plants for all types of infections. Also, treated plants are more resistant to attacks by various pests and especially to attacks of the potato beetle. This photo was taken after the third treatment with ZEOGROW.

Impact on the quality and yield of potatoes

The numerous experiments that have been carried out in various countries worldwide confirm the very positive impact of Zeogrow,

All experiments conducted so far confirm the excellent results achieved with Zeogrow on the overall growth, development and production of potatoes. Croatia, France, Russia, Turkey, Macedonia, Serbia, Germany,

Spain are just a few of the country's so far that have recorded their findings.

All results which have been obtained so far can briefly be summarized up here:

- After the first treatment of a young potato plant the leaves get a very dark green colour, which proves that the intensity of photosynthesis in the plant increased heavily (because of CO₂ from entering calcite - CaCO₃, which is in the inter cellular area decomposed to CaO + CO₂), the chloroplast becomes very active and this increased the creation of chlorophylls grains in dealing with major life processes;
- At regular repeated Zeogrow treatments, the plant intensifies its biological processes and the plant becomes very vital and very resistant to all biotic and a biotic stresses;
- On treated plants we noticed the increased resistance to common potato diseases, and parasites like the Colorado potato beetle which leads to a reduced need of chemical pesticides;
- One of the most important impacts of regular treatments of potato with Zeogrow is the increased yield (harvest) of about 20-30% compared to untreated potatoes on the same plot;
- It also intensifies the flowering of potatoes, increases the number of flowers, the blossoms are larger with intensive colour and the flowers open at the same time. Flower treated plants give larger fruits in which the seeds of the potatoes became riper with increased germination power.
- Treated potatoes contain a greater percentage of dry matter (15-20%)
- The matured potatoes have a more uniformed shape, uniform colour, and the surface is smooth and bright. Treated potato plants grow the same size, same shape and have a healthier appearance;
- The treatment has improved the taste because the potato contains higher

amounts of protein, amino acids, vitamin C and other important ingredients for human nutrition.



Treated with Zeogrow (3 X)

Untreated

In the picture above we can see potatoes treated three times and un-treated potato tubers, the differences are huge. The treated potatoes have an equal size and similar shape. The tuber colour was lighter. The potatoes vary massively in size, colour and form, even greater is difference in taste and nutritive value. Treated potato tubers contain 20% more dry matter than untreated tubers resulting in a longer shelf life. (Photo by Ž. Horvat)



**In the picture above, taken in Chuvashiya, Russia, 2008, we can see two different rows of potatoes. The right row is treated only once with Zeogrow, while the left row is not treated. As you can clearly see the row of treated potatoes is in full development and flowering. In this row we did not find any Colorado potato beetle. The plants in this row had no damage or diseases. In contrast, the untreated row of potatoes was partially destroyed by an attack of Colorado potato beetle
(Photo by D. Dumančić)**

Conclusion

Potatoes certainly belong to a plant culture which has so far provided surprisingly good results after using Zeogrow. Results were particularly good where the spraying of the plants was performed more frequently (once a week or once every ten days). To sum this experiment up, we have achieved amazing results with the use of Zeogrow in regard to increased production and in terms of the quality of potatoes, as well as for the resistance of the potato to unfavourable conditions, the emergence of diseases and pests and the emergence of unfavourable environmental conditions and disturbances (drought, cold, excessive heat, large humidity, etc.).