

STUDY ON THE EFFECT OF REVITALIZED BIOGENIC OXYGEN ACTIVATOR IN AGRICULTURE AND MALTING

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Conducted at the OOO NPP Altin Niva Enterprise Independent Labs

Under the Direction of Professor V. Kantalinskiy

OOO NPP Altin Niva Enterprise Independent Labs offered to conduct research, without charge, to determine the usefulness of Revitalized Biogenic O₂ Activator as a *bio-activator* in agriculture. There were three studies in total.

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Study #1:

Laboratory Trials Growing Cucumbers of the type Prestige/F1 (high-yield, quick-ripening) designated for closed soil cultivation, testing various dilutions of Revitalized Biogenic O₂ Activator, with the Control using ordinary tap water, in order to examine the differences in:

- germination
- sprouting
- growth energy

Subject:

The cucumbers were of the Prestige/F1 type (high-yield, quick-ripening), designated for closed soil cultivation. All seeds were of the 'Elite' brand with guaranteed germination of no less than 98%.

Trial protocol:

In both the Control, which used ordinary tap water as its growing solution, and each of the 5 Experimental Trials, each using a different dilution of the Revitalized Biogenic O₂ Activator, 50 cucumber seeds were used. To ensure authentic results, fifty repetitions were conducted on both the Control and each one of the Experimental Trials.

The Control Group: To begin, the seeds were soaked in *tap water* that had first been allowed to settle, after which it was warmed to 30 °C before adding the seeds.

Trial 1: The seeds were soaked in undiluted Revitalized Biogenic Oxygen Activator

Trial 2: The seeds were soaked in a 30%/70% solution of Rev O₂ / Tap Water

Trial 3: The seeds were soaked in a 50/50% solution of Rev O₂ / Tap Water

Trial 4: The seeds were soaked in a 10/90% solution of Rev O₂ / Tap Water

Trial 5: The seeds were soaked in tap water with a .02% volumetric addition of Revitalized Biogenic O₂ Activator

The seeds used in both the Control and Experimental trials were soaked for four hours straight in their respective solutions, then placed in filter- paper lined Petri dishes with identical conditions, the filter paper having been moistened with the respective soaking solution. The Petri dishes were then incubated at 24°C in 76% humidity.

Results: The sprouting of the cucumber seeds occurred within a 7-12 day period and achieved 100%, or close to, for both the Control and Trials within that period. The speed of sprouting and the resulting biomass, however, differed among the different Trials and the Control. This can be summarized by the following:

- a) All of the experimental seed sprouting in Trials 1 through 5 occurred two days earlier than the Control.

- b) All the Experimental Trials 1 through 5 yielded growth energy results that exceeded the Control group by 40.7% on average...

Sprouting Timetable						
	DAY 7	DAY 8	DAY 9	DAY 10	DAY 11	DAY 12
CONTROL	30%	34.7%	50%	57%	82%	99%
TRAIL 1	35.4%	43%	58%	73%	94%	99.6%
TRIAL 2	27.3%	32.9%	50.3%	56.3%	81.2%	100%
TRIAL 3	31.1%	33.2%	49.1%	57.6%	84%	99.8%
TRIAL 4	30.7%	34%	52.3%	55.9%	83.12%	99.8%
TRIAL 5	42%	53.7%	74.9%	100%		

The above Sprouting Timetable shows complete or near complete seed germination occurring on day 12 in all Experimental Trials as well as in the Control. However, all of the experimental seed sprouting in Trials 1 through 5 occurred two days earlier than the Control, with Trial 5, accounted for by the biological activity of Revitalized Biogenic O₂ Activator when added in small concentrations, exhibiting the most rapid sprouting. Of note, too, is Trial 1 with a consistently greater growth dynamic using undiluted Revitalized Biogenic Oxygen Activator.

Weighing the twelve-day-old sprouts showed that the biomass volume of plants subjected to the undiluted Revitalized Biogenic O₂ Activator of TRIAL 1 exceeded that of the Control by 23.4%; in Trial 5 the biomass was 36.4% more than the Control.

Traces of increased bio-activation not documented here were evident in later development stages beyond the 12 days of this study as well.

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Study #2: Radishes and Cucumbers Grown in Field Trials:

Radishes were grown in a Field Experiment to determine the of Revitalized Biogenic O₂ Activator as compared to ordinary tap water, which was used in the Controls, on:

- germination
- growth energy
- fruitfulness

Subject: The radishes selected were of the quick-ripening type, designated for closed soil cultivation, and all seeds were of the 'Elite' brand, with guaranteed germination of no less than 98%.

Trial Protocol:

Sixteen 10 m² garden-beds – four controls and four of each of the Trails (12 in total) – were planted with seeds and soaked according to the dilutions of Revitalized Biogenic O₂ Activator used in Trials 1(undiluted Revitalized), Trial 3(50/50% dilution Revitalized/Tap water) and Trial 5(.02%/99.08% dilution Revitalized/Tap water) of the *laboratory cucumber trials*, while the Controls were grown using ordinary tap water. Experimental Trials and the Controls consisted of 50 radish seeds. Fifty repetitions were conducted on both the Controls and each one of the Experimental Trials to ensure authentic results.

Results:

A clear picture of bio-stimulation appeared during field trials of radishes. Root-crop productivity in the Control garden-beds after 21 days of vegetative development reached 1.85 kg/m², while the productivity

of Trials 1, 3 and 5 using the Revitalized Biogenic O₂ Activator solutions were 2.21 kg/m², 1.98 kg/m² and 2.7 kg/m² respectively. These results showed an approximate 18% increase in radish productivity in Trial 1, 8% in Trials 3, and a 32% increase in Trial 5. This greater *vegetative development*, in addition to a *reduced seed sprouting period*, attested to the bio-activity of Revitalized Biogenic O₂ Activator.

Field Trials were also conducted with *cucumber seeds*, which demonstrated that the Experimental trial cucumbers were ready for collection four days earlier than those in the Control cucumber garden-beds, and were more abundant.

Traces of bio-activation not documented here were also observed in later development stages of these radishes and cucumbers.

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Note:

To establish recommendations for Revitalized Biogenic Oxygen Activator to be used as a bio-stimulator in agro-technology, the following research must be completed:

- Comparative plant health research
- Comparative biochemical research (vitamin, mineral, phytochemical content of the plant and fruit)
- Comparative genetic research

Correct agro-technological methodology in the use of Revitalized also must be established.

Such a body of research along with its results would serve as a recommendation for Revitalized/O₂ Biogenic Activator to be implemented in the agro-technology of closed soil agriculture.

The research that we've conducted and summarized here above shows Revitalized Biogenic O₂ Activator to have good future potential for gardening and agriculture. Reducing the vegetative period by even one rotation would allow for an extra rotation of such cultures as radishes, dill, fennel, lettuce and parsley in the same plot of land.

Further experimentation could provide techniques and methodologies for increasing the number of rotations of other plant cultures as well.

Trial results so far seem to have clear commercial value, which is always determined by volume of yield and lowered costs.

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Study #3:

Of special interest, a short study was conducted on the effect of Revitalized Biogenic O₂ Activator in the **sprouting of hops**. These results on the malting process are of particular value, since reducing the time it takes for sprouting by even 1.5 - 2.5 days is a significant shortening of the malting cycle. The affect of Revitalized Biogenic O₂ Activator in the sprouting of the hops are summarized below:

	HOPS SPROUTING	
	DAY 7	DAY 8
CONTROL-Tap Water	67%	94.0%
Undiluted REV/O ₂ Activator	84%	98%
TAP/REV/O ₂ (50%/50%)	72%	95.1%
TAP/REV/O ₂ (99.8%/0.2%)	96.4%	98.7%

These results demonstrate the commercial value of implementing Revitalized Biogenic O₂ Activator in the malting process, since for every 300 days of an average active malting floor, 14-17 seed batches are produced, with each batch amounting to a 700 to 1200 ton malting load. Considering that one ton of malt alone is valued at € 800, any increases in malting load, due to the increased yield from the added bioactivity contributed by Revitalized Biogenic O₂ Activator, could add to the income of a malting floor operation, or beer manufacturer significantly.

Since the malting trials were conducted only twice on relatively small 50 kg seed batches, without actually completing the beer brewing process, it is important that the experimental seed volume be increased in future trials and the brewing process fully carried out for a more serious round of tests.

Should breweries express interest and be willing to cover the research expenses, a complete testing methodology could be put forth. The same applies to any agricultural enterprises interested in furthering the research involving the implementation of Revitalized Biogenic Oxygen Activator.

*Professor V. KANTALINSKIY is a recipient of a Russian Federation Medal of Achievement in Agricultural Science.