

On the Effect of Horn Manure

Discussion on Evidence in accurate Trials

by Ton Baars and Dorothee Pfirmann

At the University of Kassel-Witzenhausen in the teaching of biodynamic cultivation a diagram of the summarised research into preparations (IBDF Koenig) is shown to the students. This diagram conveys the hypothesis that the field preparations, horn manure (P500) and horn silica (P501) harmonise the growth of plants. In infertile, poor conditions for growth they lead to an increase in yield and in rich, luxuriant conditions they check the development of the yield. Furthermore there is talk about an increase in quality of the plants and produce.



Pot trial with Solutions of horn manure from two different sources

What is questionable about the diagram though is the high number of non-significant results in comparison to the relatively small number of significant results. This indicates that in numerous accurate trials the differences were rather slight. According to the above-mentioned hypothesis a small or non-existent effect of the preparations could be put down to growth conditions that were already in balance. Nevertheless, if you ask around among preparation researchers, then you will come up against a batch of further ideas of why the preparations frequently fail to show a measurable effect:

- The preparations, above all the horn manure preparation, extend their effect to as much as 12 metres away. This means that neighbouring plots are treated as well if the distance is too small to the plot being treated.
- If the conditions for growth are in balance, then the soil and plants do not respond to the preparations.
- The preparations (only) work if you stir them enthusiastically with your heart and soul.
- Stirring by hand is much better than with a machine.
- As you repeat the same research year on year you find a decreasing effectiveness; a pointer to the world of elemental beings, who do not feel like joining in the same trial time and again.

- The preparation should not come into contact with plastic. Homoeopaths, on the other hand, warn against contact with iron as a negative influence.
- The preparations do not work in a visible way but are rather there for the future of humanity.

If you look further afield than Germany (to other countries), then you will often hear of the successful experiences people have with the application of the preparations. India is mentioned as a country where the preparations simply work. In Australia Alex Podolinski has gathered an enthusiastic group of biodynamic farmers around him who have developed solutions using machines to treat huge areas. Podolinski has gained a foothold in Italy, Switzerland and France too and has improved the quality standards in the production of the preparations substantially. In Germany people take a rather critical stance towards Podolinski's insights and new developments even to the point of rejecting them.

Even the Institute for Biodynamic Research (IBDF) has changed its advice on the application of the preparations in recent years. The preparation work has received a new impulse through the research into formative forces. In contrast to Podolinski's developments the IBDF recommends stirring solely by hand and abstaining from the use of machines. Instead, according to them, the amount applied per hectare can be reduced from 40 to 5 litres without loss of effectiveness.

FACTORS OF THE WORKING OF HORN MANURE: VARIANTS WITH BARLEY

At Kassel University we began with our own horn manure trials in 2009. Above all, individual factors of the horn manure effect were to be tested by scientific methods. Following the advice of various biodynamic preparations researchers no plastic equipment was used either for the stirring or for the application. In order to involve as many levels as possible we did a germination test with cress, we examined the root growth in root boxes, carried out pot trials in the greenhouse and set up field trials. The field trials took place on the Neu-Eichenberg experimental farm, from which the sieved earth for the pot trials was taken too. In all trials we worked with organic summer barley, and in the field trials potatoes were grown as well. Altogether we tested two water treatments and six horn manure treatments alongside one another repeatedly. The variants were distinguished through the factors horn (plastic, genuine), provenance (Neu-Eichenberg, Hutzelberghof), the contents of the horn (fresh manure, P500, P500 killed off) and the stirring (by hand, machine). As a further question the human being was included for the placebo effect by comparing double blind and open trials. The trials were accompanied by six motivated students and documented and evaluated in B.Sc. dissertations.

NO CLEAR RESULTS – OPEN QUESTIONS – IS THE QUALITY RIGHT?

In 2009 hardly any of the partial projects produced clear results. If no differences emerge under clean, controlled conditions a scientist is inclined to conclude that the preparations have no effect. Another explanation could be taken from the model of the IBDF. Were the growing conditions already harmonious enough so that there was nothing to balance out? Or else were other important influential factors not taken into consideration in the carrying out of the trials? From a look at the above list of opinions some points can be eliminated: the student group was experienced in biodynamics and very enthusiastic; it was the first year of the trials with a new set of questions, and the elemental world, nonetheless, did not co-operate. However, there was one thing, with which we had a bad feeling from the start: was the material that came from the horns in 2009, in fact, an effective substance, or was the preparation not mature, not really fermented? Our senses told us that the preparation still smelled of cow manure and some variants were green. The best results derived from the second trial run, in which the horn manure preparation had longer to finish off fermenting in boxes lined with peat. These clues indicated that the lack of differences in our results could possibly be put down to the poor (therefore, ineffective) quality of the preparation. One seed grower thought, in addition, barley is not a good plant to show these results. It would react less sensitively to the preparations than, for example, the vine.

NEW TRIALS: FOCUS ON QUALITY OF THE PREPARATIONS

In September 2009 horn manure was buried once more. We paid particular attention to the consistency of the manure so as to produce a preparation of as good quality as possible. Only well-formed, relatively dry manure from dry cows was used, cows that had been grazing on barren grassland.

	Dry Matter (%)	NO ₃ -N PH value	NH ₄ -N (mg/kg DM)	NO ₃ /NH ₄
Plastic horns (Hessen)	19.0	7.3	13.1	119.3
Old horns from 2008 (Hessen)	19.1	7.1	1059.3	348.8
New horns from 2009 (Hessen)	18.7	7.0	2165.2	516.6
C. Noro (Italy)	32.1	7.2	1152.1	82.3

Various Horn manure preparations: analysis of the Horn content in 2010

In November 2009 we came across the horn manure preparation of Carlo Noro in Italy, who works with Podolinski's method. The quality was convincing: black, like humus, colloidal moist. In 2010 in our enthusiasm about the quality we obtained horn manure preparation from Italy and compared it with our own material from Hessen.

The quality of both preparations was examined in laboratory analyses and demonstrated clear differences within certain parameters. The nitrate/ammonia ratio, which indicates the degree of maturity, was much higher with the Italian preparation than with our Hessian preparation. Also the dry matter content was comparatively high

with the Italian preparation. From direct, sensory observation the home-grown preparation of 2010 was much better fermented than in 2009.

SERIAL TRIAL WITH DIFFERENT PLANTS

From May 2010 on new greenhouse trials were arranged under completely simplified conditions every five weeks. Instead of the sieved earth of the organic experimental farm bought in soil base soil, a substance rich in peat low in nutrients, was used. The preparation was stirred in plastic cement buckets with a home-made besom (approx. 30 gm./10.). We took up the hunch that barley is unsuitable for trials by putting the comparison of various cultivated plants in the foreground of our first trial. Besides a different variety of summer barley, tomatoes, peas and quinoa (all from biodynamic seed) were grown. As additional variants stress factors were built in to investigate whether the horn manure preparation is able to balance out stress in the form of a salt solution or artificially compressed soil. There was no more capacity in this trial for a comparison of the preparations of different origins (Noro from Italy, our own preparation from Hessen). The preparations of from both sources were mixed and stirred in one variant and applied. The germination and the plant development were evaluated regularly. After five weeks definite differences were to be seen so that the plant height, leaf area and plant mass could be determined and evaluated. The horn manure preparation led to an improved early development in all cultivated plants and with all treatments. On the other hand, the horn manure that had been produced in plastic horns could not reduce the salt stress. The effects were really major with tomatoes and quinoa, whereas with summer barley they turned out to be rather minor. ▶

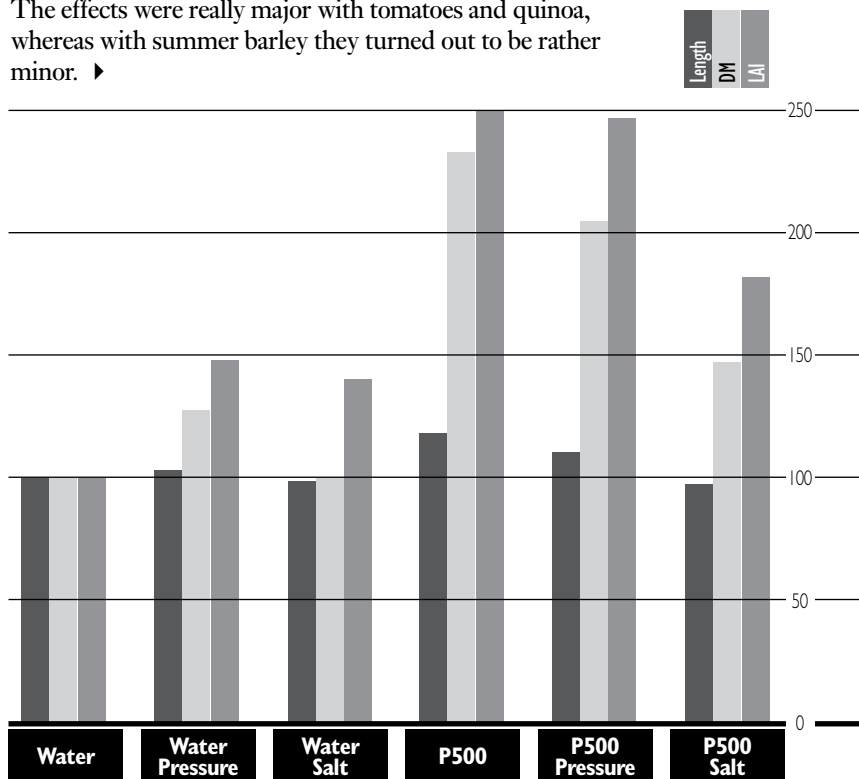


Diagram 1. Horn manure influences plant growth

Effect in the first five weeks after germination on average with four cultures (barley, peas, tomatoes, quinoa) and two trial factors: two stress conditions (salt, soil compression) as opposed to untreated (water), once without, once with the biodynamic preparation 500; relative comparison as a control (water without stress = 100%). What was measured was plant height (left-hand column), dry mass per pot (middle column) and leaf area index (right-hand column).

TESTING OF ORIGINS AND WAYS OF PREPARING

With the following five trials we continued to use summer barley for comparison and the strongly reacting balcony tomato. Our key concern was to develop a model with which the effectiveness of the horn manure preparation can be established. A series of unresolved factors was investigated systematically, such as water temperature, origin of the preparation, concentration of the preparation, dilution, comparisons with plastic horns and fresh manure (unfermented manure straight from the cow).

The third trial, the trial we had started at the beginning of August 2010 showed the strongest results along with the first trial. Two preparations of different origins (Italy, Hessen) and a mixture of the two were compared. With the tomato the additional question was taken up whether the horn manure effect has a material background. To this end the Italian preparation was diluted to 1/2, 1/4, 1/8, 1/16 after the stirring. The different solutions were taken out directly without further stirring.

In the course of six repeats the results were different to a highly significant degree. At the harvest a plant group emerged with stunted growth which had halted its growth and a plant group which had obviously developed further, as with the first trial. To group 1 belonged the water treatment (control), the highest levels of solution 1/8 and 1/16 and the mixture of preparations of both origins. To group 2 there belonged the undiluted Hessian and the Italian preparation and the lowest levels of solution 1/2 and 1/4.

A PROCESS OF STIMULATION FOR THE SOIL BIOLOGY?

If we endeavour to interpret the results, then we hit upon the question why the solution levels did not lead to a gradual effect, as, for example, in trials with an increasing amount of nitrogen per hectare. Here we see a so-called 'on-off effect'. Horn manure works or else it does not work, but there is no grading in its effectiveness. This phenomenon could point to a process of stimulation for the soil biology. According to this hypothesis the substrata of the soil are inoculated with micro-organisms from the preparation and these microbes are able to enliven the soil base soil, if they are in a sufficiently high concentration. Too few microbes (in the high solutions and the water treatment) mean that the process is not triggered. Too much of the preparation does not make sense either because it is matter of a threshold which has to be reached. Much more difficult or unexplainable is the question why the mixture of both preparations demonstrated no effect, although the same thing was done as in the first trial in May 2010. In May the effects were clear, in August, however, no differences emerged.

In the meanwhile we have reached our seventh trial since spring 2010. From the fourth trial onwards we were unable to determine an effect of the application of preparations of any kind! Neither the rate of germination, nor the plant development, nor the harvest after five or six weeks showed differences. For the current trial we have taken cultivated plants which germinate in the autumn as a rule. We are still awaiting the results.

REPEAT IN 2011 SHOULD ESTABLISH THE SOIL BIOLOGY EXPLANATION

We have not yet repeated any of our results. New preparations are buried in the soil. For 2011 the question first and foremost is whether the good results from 2010 may be repeated. Does horn manure have an effect principally in spring? What is this business with solutions? By means of what are the growth processes stimulated?

A scientific, biological explanation could be that a properly produced horn manure preparation is an accumulation of microbes which get the life processes going under poor, barren or stressed conditions. This concurs with the observations announced by Koenig and Dewes which show that the best effects of the field preparations (horn manure and horn silica, usually together) are found under poor conditions. Perhaps this fits the picture that horn manure demonstrates an effect, above all, in developing countries (India, Egypt, Bolivia), where possibly relatively poor nutrient and life conditions prevail or in wine-growing, where the vine grows on barren soil. In 2011 it should emerge whether the hypothesis constructed and cited here stands or falls. This should be followed by an investigation into whether it is possible to establish in the soil and the plant which physiological processes are taking place in the background. The strength of the scientific view of factors is that people have the opportunity to investigate various individual effects meaningfully and to describe them for third parties in a comprehensible way. Thus, access to the black box of the working of the preparations could be opened up.

The results from the first year of trials have been documented and evaluated in final year dissertations. Enquiries about them can be made with Ton Baars. ■

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Note: The original article had a long list of references. Please contact the editor for more details.

Translated by John Weedon

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