PLOCHER Study Series

40 YEARS 1980-2020 PLOCHER®

LIQUID HUMUS

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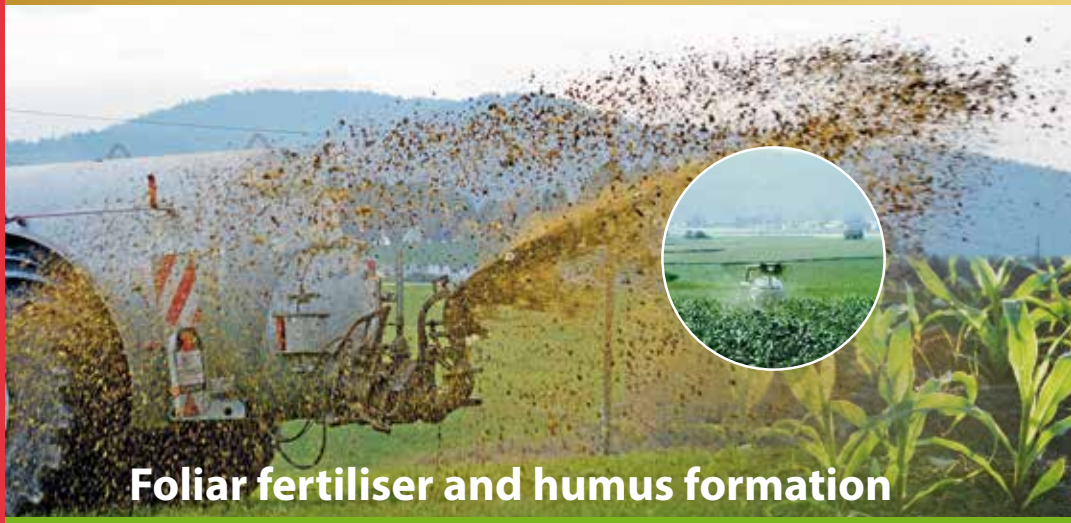


www.fluessighumus.de

It is high time

for us to be preserving our natural resources for the benefit of following generations.
Why is such a burden being imposed unnecessarily on the ecological balance? Why do farmers discard their own "in-house" fertiliser? Why is the earthworm population being obliterated? Why is soil compaction and erosion progressing unhindered?
Why is ground water being unnecessarily contaminated with toxic substances?

Looking back over 40 years of development, experience and practical application, we would like to make you more aware of how important and necessary it is to think in holistic terms and act sustainably. Following nature's example, we want to create cycles which activate life.

The purpose of using PLOCHER-products is to improve the vitality of water, soil, animals and plants as well as to promote optimum use of every agricultural business's own resources, thus making the farmer increasingly independent. So that agricultural work becomes rewarding again - as well as enjoyable.

Warmest regards

R. Plocher

Roland Plocher
Meersburg, September 2020

The course of German agriculture

Erhard Hennig

Agriculture from 1920 to 1950

Agriculture and crop production were practised in conformity with nature. In today's terms, we would say "on an organic basis". A distinguishing feature throughout these decades was the complete absence of toxic substances in arable farming. Crop diseases and pests occurred rarely, but the damage threshold was never reached and the balance of the crops and soil was never disturbed. Most of the diseases which affect cereals, maize, rape etc. today were unknown in those days. There was no reason to produce poisonous chemicals, as happens today, and to contaminate the land, the topsoil, with such products.

And the weeds? There were virtually no problems in this regard.

- Weed control was implemented exclusively on a mechanical basis. A cultivator was used at the appropriate time for cereals and beets
- In early spring, as soon as the soil dried out and the first "white strands" of the weeds appeared, the levelling harrow was used
- The stubble plough was used immediately after cereal harvesting
- Soil was worked with a two-depth plough (shallow turning, deep loosening)
- No areas were bare of vegetation – application of "evergreen" method
- Scrupulous cleaning of seeds
- In the crop rotation with potatoes, rape and field forage growing it was easiest to keep weeds under control.

Fertilisation:

- Use of farm's own fertilisers, manure, liquid manure and slurry as aerobic treatment
- Soil sampling, nutrient analyses
- Intercropping - legumes - white clover
- Great attention was accorded to the state of the soil as well as the humus and soil condition.

According to a wise old saying:
Living off the land and the forest the human
being can survive for thousands of years in
the same way as he indeed has done for
millions of years already.

1950 – COMMENCEMENT OF A FAILED AGRICULTURAL POLICY

The four decades from 1945 (end of the war) until 1985 saw a radical change of unparalleled proportions – a complete restructuring of agriculture, of which neither the end nor the effect are foreseeable as yet. Rapidly increasing labour shortages, massive migration from the rural to urban environment, high capital requirements for machines and equipment to replace human labour created an extremely difficult situation for agricultural businesses. This transition led to complex rationalisation measures
in all areas of agriculture. The agriculturalist today is hardly a farmer any more, he has become an entrepreneur and producer, dependent on industry.
These people are becoming increasingly constrained by strict quota regulations.
They are degenerating into mere underlings of a self-inflating agricultural administration.
The yield increase rate could indeed be raised by around 50 percent in recent years,
but to achieve this fertilisation was increased by 350 percent
and expenditure on biocides increased by 1,350 percent.

It is not fair to blame the farmers for this style of management. Circumstances familiar to all of us force them to disregard the most fundamental rules concerning fertility of the soil and to use substantial quantities of chemicals in the form of fertilisers and pesticides.
The chemical industry produces millions of tons of herbicides, insecticides, fungicides: so-called "plant protection products". 1500 kinds of respiratory, contact and stomach poisons are commercially available in the Federal Republic of Germany alone; they contain 150 types of active substances. Every year the chemical industry launches around 500 new products on the market.

Increased cereal cultivation in a significantly simplified system of crop rotation as well as the increase in intensive livestock farming, i.e. a rise in crop and animal production compels farmers to consistently increase quantities of fertilisers and biocides. This is accompanied by a noticeable increase in diseases which previously were virtually unknown. Our agriculture has been industrialised to a very high degree over the last 30 years, and in this process it has become completely dependent on industry.

THE ENERGY PROBLEM

As a consequence of the massive structural change in the direction of constantly increasing industrialisation
and more intense use of chemicals, the rate of energy wastage is particularly high. A major part of the energy today is required in the form of synthetic mineral fertilisers and for the manufacture of pesticides and herbicides.
French scientists have calculated the "direct" energy expenditure as follows:
Based on 100 kg of wheat harvested, the energy expenditure for the conventionally cultivated field is 2.5 to 3.5 times higher than for the biologically cultivated field.

An environmental catastrophe of gigantic proportions is in the making: our arable soil with its highly diverse micro fauna, in other words the entire ecosystem soil, has been seriously damaged by acid rain, incorrect management and toxic chemical substances.
The humus soil, the most important component of the topsoil, is contaminated by treacherous toxins such as cadmium and mercury. As a result of the acids in the soil, the nutrients calcium, magnesium and potash are leached out, they disappear into deep layers of the soil and far down into the ground water. On the other hand, aluminium, iron and manganese ions are released, but even the tiniest quantities of these substances have a toxic effect on the fine root system and on the soil organisms. Certain heavy metals and chlorine compounds which penetrate the soil together with the chemical toxins are capable of contaminating the arable soils on a permanent basis. Such damage is irreparable. The toxic effects of acid rain and cadmium do not simply produce a cumulative effect, they multiply!
The consequences of the rampant soil contamination are rather hard to comprehend, they seem like an apocalyptic vision. Here, for example, the words of the German Federal Environment Agency: "If the current level of contamination of the soil with heavy metals is not stopped, decisively and quickly, the realistic prospects are that within a period of 50 years any significant food production in this country will become impossible."
And: "If the trends continue, within a period of 30 to 70 years, usage restrictions will have to be imposed across the entire area of arable land in West Germany.
Officials employed at the Ministry of Health in Bonn produced a study in 1981 which proposes "shutting down" 600,000 hectares of contaminated arable land and 400,000 hectares of pastureland (see very impressive book by Jochen BÖLSCHE: "Was die Erde befällt" for more information). In North Rhine Westphalia one third of all cereal samples taken since 1980 have been considered to be contaminated. In other parts of the country, according to official requirements "only crops not intended for human consumption are to be cultivated".
If our generation continues to exploit the soil so that we have food to eat, there is a realistic risk later that many of our children and their children may have to starve!

If, in addition to forest dieback, the dying off of the soil continues unhindered, this will end in an environmental and food disaster of unprecedented dimensions!

Flyer
Healthy soil
= healthy forest
please request your copy!
With solutions for revitalisation of the forest soils

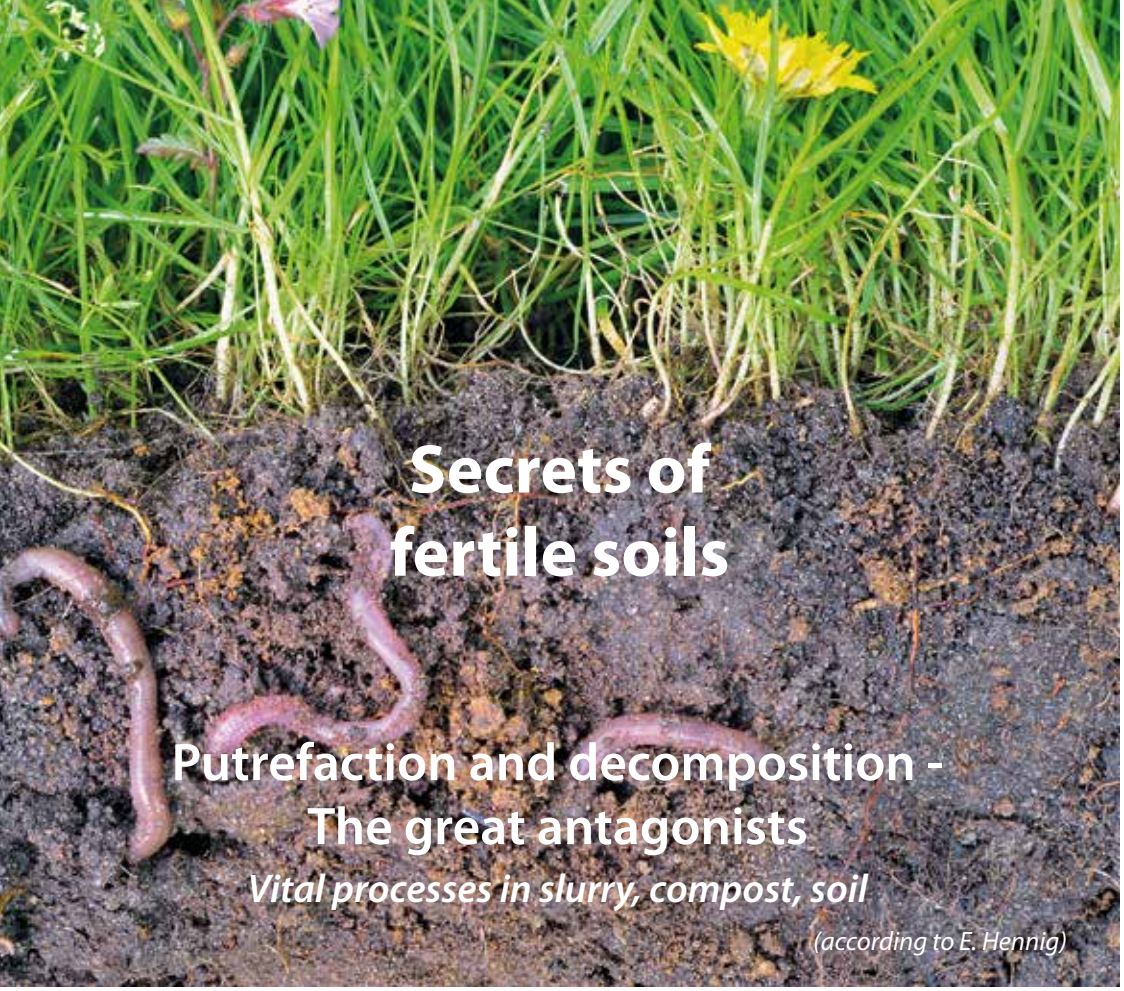
The global forest dieback alone is a reason for intense concern, also here in Germany. Forestry experts fear that if the forests continue to die, humanity will soon be confronted by the most serious environmental catastrophe in history. If, in addition, the arable land - with its well-balanced microbiology - also fails because the soil is absorbing increasing quantities of toxic substances and soil life is being killed off, the fields will have no chance of survival either. Nature inexorably seeks revenge for the serious sins committed against the ecosystem. A full-scale strike by nature is meanwhile perfectly conceivable.
The term "apocalypse" would become reality. A major proportion of the world population would perish as a consequence of hunger, coldness and disease. Entire sectors of industry would become superfluous and have to be closed down. The remainder of the world population would be without work.

Let's just assume, quite hypothetically, through the elimination of fertilisers and pesticides and refraining from purchasing concentrated feeds in the entire EU area, the yields from the fields and the performance in the animal housing would be reduced by 10 to 20 percent. In this way, in one fell swoop, virtually all agricultural policy related problems would be solved:
– there would be no more unsellable surpluses in the EU;
– agricultural subsidies would cease to be the bottomless pit which they have meanwhile become;
– the cereal, sugar and butter mountains would become a feature of the past;
– German farmers would no longer be recipients of subsidies.

FROM CHEMICAL-BASED AGRICULTURE TO ECOLOGICAL-BIOLOGICAL FARMING
From the above statements it becomes clear that the application of industrial methods in agriculture in the long-term will lead to an ecological, and consequently also an economic, collapse. So far the economic requirements have been clearly superordinate to the ecological principles.
According to the rules of ecological-organic agriculture, the following applies:
• no use of synthetic, water-soluble fertiliser salts
• no application of toxic substances and chemicals
• no purchase of concentrated feed from overseas; this complies with the fundamental requirement of a closed economic cycle
• Adherence to a hea lthy crop rotation, also including legumes
• adherence making use of the farm's own fertilisers: manure (composting), liquid manure and slurry through aerobic decomposition processes
• appropriate form of soil tillage, partially ploughless.

Ecological agriculture produces living substances, on which the health of people (and animals) is dependent and works with the living system of the soil, which also needs to be preserved for later generations. A reorientation of German agriculture is the order of the day! Ecological thinking means holistic thinking!

The course of German agriculture
Erhard Hennig from "Humus" trilogy 1988



Regulation concerning Circulation on the Market of Fertilisers, Soil Treatment, Growing Mediums and Plant Products - Fertiliser Regulation (Düngemittelverordnung - DüMV)
Section 4 Circulation on the market of farmyard manure, soil treatment, growing mediums and plant products
(1) Farmyard manure, insofar as it is not placed on the market as fertiliser according to annex 1, subsection 3, as well as soil treatments, growing media and plant products may only be placed on the market if, when used properly, they do not damage the fertility of the soil, the health of humans, animals and crops and do not endanger the natural balance.

Conclusion:
According to this legal situation, therefore, it is not possible to spread anaerobic slurry!
On this issue, see putrefaction-decomposition - the great antagonists according to E. Hennig *(page 9)*.

Putrefaction and decomposition - The great antagonists (according to E. Hennig)

Vital processes in slurry, compost, soil

Putrefaction (anaerobic)	Decomposition (aerobic)
without oxygen	with oxygen
hostile to life pungent-sharp smell of putrefaction	supports life little or no odour
involved are: oxygen-fleeing bacteria (anaerobes), pests, insects	involved are: oxygen-loving bacteria (aerobes), yeasts, fungi, earthworms
this results in: formation of rotting gases (methane, hydrogen sulphide) and loss of nitrogen as a consequence of ammonia production	this results in: nitrogen being bonded in bacteria and fungal proteins which act as a permanent nutrient source
formation of: raw humus, insect humus	formation of: real humus, permanent humus, earthworm humus
formation of: toxins (toxic substances, such as botulism), rotting gases, virus and pest infestations, which encourages disease, plants and animals are at risk	formation of: trace elements (e.g. zinc, copper), magnesium, vitamins, enzymes and natural antibiotics, viruses are destroyed, pests have no habitat
ground water/emission: danger because pollutants are in solution	ground water/emission: no danger because nutrients are in bound form
PUTREFACTION	**DECOMPOSITION**

In memory of Erhard Hennig by Roland Plocher

The late Erhard Hennig and I were very good friends. He recognised the possibilities which the PLOCHER principle provided for nature, supported my work by giving specialised talks, even after he had reached an advanced age. So it gives me great pleasure to be able to continue to pass on his fundamental thoughts - in the interests of a safely habitable environment.

For me, in a very fascinating way, he laid the foundations for holistic thinking. At an early stage, Erhard Hennig recognised the hazards of agricultural chemistry and put awareness of humus management into a positive perspective. The fundamental principles which he developed over a period of 60 years have provided me with essential guidance in my work.

Erhard Hennig's last public talk, when he was 91 years of age, was given at a PLOCHER conference in Meersburg: "Nature has its own laws, in other words we need ecologically oriented agriculture involving holistic thinking and thinking in terms of material cycles."

In his book "Geheimnisse der fruchtbaren Böden" (Secrets of Fertile Soils), in the issues published until 1997, you will find the following article written by Erhard Hennig about the PLOCHER System:

Erhard Hennig and Roland Plocher

From the Material to the Spiritual

The concept of "building forces" which was developed by Samuel Hahnemann, founder of classical homeopathy, is looked upon today as "primary pattern", the "information" upon which also the *Roland Plocher* system is also based. The denser matter is, the faster its vibrations are.
Chromatography, which is used for soil and humus analysis, renders visible micro structural processes such as the activity of the soil or its mineral or vitamin content.
Behind every material manifestation is a spiritual concept. This means that a material garment is transformed into an energetic-informative form.
It is no longer the molecules which act but their energetic-informative potential (*Georg Raba*). We should be more aware of these cosmic rules (hermetic rules).

The Plocher Energy System
An ancient dream about mankind's relationship with nature is about to come true.
A system by which the energy transfer from solid, liquid or gaseous carrier aggregate state can be transferred to organic or inorganic carrier materials was developed by means of empirical experiments. The latter permanently surrendered the transferred purposefully catalytic information to the surrounding medium.
The key idea of the Plocher energy system that the field of vital energy by which we are surrounded can be concentrated (*Georg Raba*). As a result of this new scientific thinking a new view of life seems to emerge, perhaps as a form of compensation for the environmental crimes committed by the human race.
The device and informed carrier materials work without the usually recognised forces like electricity, magnetism, radioactivity, chemical reaction or heat. In spite of this all scientific principles are entirely fulfilled, in that an experiment is carried out which is independent of its physical conditions, that is, it could be repeated. For example thc aerobic process is set going by oxygen information but in the course of this process no oxygen is taken from the atmosphere.
Confirmed results also regarding the system´s harmlessness for human beings, animals and the environment, are now available. The ecological cycle can be completed by this system.
The aims of the Plocher Energy System are far-reaching: slurry, surface water, waste water and sewage sludge should all be put back into a healthy cycle as a basis for a rehabilitation of nature. The increased use of drinking water without nitrates is only a part of the possible total programme.

ROLAND PLOCHER® integral-technik

Based on recognition and experience of the fact that it is not the actual substances which produce the effects but rather their energetic information, in 1980 Roland Plocher developed a naturally compatible, resource-saving, physical method of transferring non-magnetic information to enable the purposeful, catalytic activation of biological processes. The PLOCHER system is not in any way dependent on place, time and person, the results can be reproduced at any time and verified using conventional measuring techniques. The prerequisites of fundamental scientific principles are therefore fully complied with.
As a result of the non-magnetic transfer of information, the physical-chemical structure of the carrier material does not change. The PLOCHER products which are produced on this basis function as catalysts with the task of initiating, activating or optimising natural processes.
40 years' experience speaks for itself: PLOCHER products offer perspectives for people-water-animals-soil-plants which facilitate a nature-friendly circular economy incl. environmental protection (soil, water, climate) and, furthermore, help to reduce costs!

Company headquarters in Meersburg

Production

Sustainable agriculture with PLOCHER

We don't just talk about it - we act, and have actually been doing so since 1980: Ensuring a livelihood by sustainable, economic management begins with refining the farm's own production resources - slurry/manure/digestate - because fertilising means stimulating the soil!

Wanting to fertilise the crops, although actually an old concept, is not correct. Because the fact of the matter is that the soil organisms first have to convert the anorganic nutrients before the plants can absorb them at all.

This is why we focus directly on the soil. It is your most valuable asset and the key to your business success and biologically high-quality food!
Promotion of composting (aerobic) = emission control = climate protection
Active soil life = protection of soil and plants = protection of ground water

PLOCHER products support you in this!

PLOCHER-Technology, well-proven since 1980, helps agricultural enterprises:
- to save costs
- to ensure yields
- to reduce working time
- to produce organically
- to protect the environment

So that agricultural work becomes rewarding again - as well as enjoyable!

DLG Field Days 2016

Resources: creating - saving - preserving

Vital element soil

The soil - a productive ecosystem! The preservation and sustainable promotion of this thin layer of humus is in the foreground of our efforts to secure sustainable profitability of soil as a production basis in the long-term. The extremely productive legion of microorganisms in the soil, if you get them on your side and look after them carefully, will take over - completely free of charge - the most effective soil processing and sustainable improvement of soil fertility.

Humus as a regulator
The decontaminating effect of a very vital, humifying soil is a regulator. It is the most important regulator known to nature. Even the most hazardous of pathogens can no longer be detected after just a few days in humifying soil (also in compost!) (Erhard Hennig "Humus" triology 2005)

Soil respiration:
The microbiology in the soil requires sufficient air to be able to breathe. If something happens to cause soil compactions for example, soil respiration will be seriously disturbed. The result is a lack of oxygen. Soil life and roots die off. The plants, however, require the CO_2 exhaled by the microbiology for photosynthesis. In turn, a part of the CO_2 is converted with the groundwater into carbonic acid. This carbonic acid is able to dissolve important trace elements for plant nutrition from the soil.

The carbon cycle is thus the engine of soil fertility.

Scientist Prof. Dr. August Raggam of Austria establishes:
If the soil were in a position, on account of its humus reserves, to store CO_2 again, we would not have a CO_2 problem. Formerly approximately 30 kg CO_2 per m^2 used to be stored in the soil – now this volume has decreased to just 4 kg! By improving the humus reserves accordingly (circular economy) it would be relatively uncomplicated to get the CO_2 problem under control. In order to prevent the harmony in the soil from becoming even further distorted, we will have to adapt our management accordingly.

The soil is a living organism and the basis for life. The PLOCHER farmer, therefore, can make an enormous contribution to climate protection by his circular economy.
The PLOCHER products provide sustainable support in this context.

The soil profile, c. 1.20 m deep, clearly depicts the effect of the aerobic PLOCHER agricultural management: Soil treatment, plant products and the use of manure and slurry additives at source in the animal housing provide sustainable support for life in the soil!

PLOCHER AGROTECHNIK ANDERS.

Aerobic agricultural management

Here the example of the common earthworm:
It drains the soil, produces nutrients and creates root space and living space for harmonious co-habitation.

View of soil profile

...slurry becomes

liquid humus = foliar fertiliser

Integrated plant protection* with plocher liquid humus

Every single day enormous economic damage ensues as a result of putrefaction processes.

Stinking, putrescent slurry (anaerobic) is unproductive and life-hostile. Toxins are formed, fermentation gases lure pests and insects. This situation is conducive to diseases and animal and plant stocks are endangered.

In order for the desired decomposition (aerobic) to be able to start in the animal housing, farmers have been using PLOCHER slurry admixture successfully for many years now. The slurry becomes liquid humus and consequently has a life-sustaining effect, forms new humus and can be spread in a crop-friendly way, always at the optimum time, as a nutrient-rich foliar fertiliser!

Slurry which doesn't stink is good for your plants to drink!

***According to the EU Regulation for Integrated Pest Management:**
"Since 2014 the principles of integrated pest management are to be adhered to."

- Protection and enhancement of important beneficial organisms, e.g. by adequate plant protection measures or the utilisation of ecological infrastructures inside and outside production sites.
- Sustainable biological, physical and other non-chemical methods must be preferred to chemical methods if they provide satisfactory pest control.

Source: EU Directive 2009/128, Appendix III

plocher liquid humus

Slurry admixture for all types of animals.
Aerobic treatment (based on decomposition) of slurry and liquid manure to form valuable liquid humus fertiliser.

Natural animal housing hygiene:
- Decomposition (aerobic) instead of putrefaction (anaerobic): Decomposition prevents the development of pathogenic germs, e.g. salmonella
- Better animal housing climate
- No putrefaction – no problem with smell!
- Reduced bacterial pressure – good for the hooves and the air in the building, fewer flies

Natural homogenisation:
- Saves stirring costs, no caustic burns - even in sunny weather
- Sinking and floating layers are reduced due to activation of the decomposition process! And the slurry flows!

Natural nitrogen fixation and pH regulation:
- Nutrients remain in the upper layer and are available to the plants
- Slurry flora, e.g. sorrel, automatically recedes
- Neutral to slightly acidic pH-value (see pages 22 and 31)

Natural foliar fertiliser and humus formation:
- Dense turf prevents trampling damage
- Humus formation and high-quality basic fodder!

Slurry becomes liquid humus = protection for soil, crops, water and climate!

EU-confirmed by long-term projects (see page 44)

Geprüft durch ECOCERT INPUTS

§ **FERTILISER REGULATIONS -** no problem ✓

The PLOCHER system completely meets the requirements for comparatively low ammonia emissions as well as the requirements relating to ground water and water protection!

UNIVERSITÉ DE SHERBROOKE

Environmental tolerance of PLOCHER products:
Investigations conducted in a variety of areas of application in different countries over a number of years were not able to detect any damaging effect on the environment caused by PLOCHER products.
Neither their basic composition ($CaCo_3$, SiO_2 or stainless steel) nor their catalytic effect mechanisms on natural processes represent cause for fears of a toxic environmental hazard.
PLOCHER products are available as natural powder, in liquid or solid form.
Application of these products in a specific milieu (water, slurry, compost, soil, etc.) changes the chemical balance of the environment by means of catalytic activation.
For example in the case of organic materials aerobic transformation processes are enhanced/supported, which lead to faster mineralisation and a higher degree of homogeneity, and possibly also to less unpleasant smell.
Trials conducted at the Institute for Environmental Tolerance and Sustainable Developments, belonging to Sherbrooke University, with PLOCHER products in a variety of different milieus (slurry, manure, compost, water…), have shown positive results, quite particularly from the quality perspective (increase in mineralisation kinetics, reduced smell, homogeneity, oxygen uptake…)
Oliver Thomas, Director
(Study see page 42)

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Slurry treatment
How floating layers are dispersed

Effect of PLOCHER slurry

The reaction of sheep to PLOCHER slurry treatment

Slurry which no longer stinks

§

FERTILISER REGULATIONS - are met ✓

The PLOCHER system completely meets the requirements for comparatively low ammonia emissions as well as the requirements relating to ground water and water protection!

Since 1990 slurry, manure and fermentation residues, which have been aerobically treated respectively with PLOCHER slurry, compost and fermentation residue additives (= natural nitrogen stabilisation), right from the beginning, in other words already in the animal housing, have met the requirements of comparatively lower ammonia emissions as well as the requirement relating to ground water and water protection!

Reliable, sustainable and profitable: natural nitrogen stabilisation with PLOCHER

Scientific services

2016 German Bundestag - WD 8 - 3000 - 079/16
Effects of the use of **nitrification and urease inhibitors** in agriculture "Due to the insufficient data basis, the use of nitrification inhibitors cannot currently be evaluated as a sufficiently reliable climate protection measure in German agriculture"
In one publication, a German group of scientists (M. Scheurer et al. 2016) investigates the question of the occurrence and retention of nitrification and urease inhibitors in water. In this context 1H-1,2,4-triazole and dicyandiamide (DCD) were detected for the first time in German surface water. DCD was ubiquitously present (omnipresent) in German surface waters. Laboratory trials showed that both 1H-1,2,4-triazole and DCD are not easily biologically degradable.
Various studies draw attention to this fact: Furthermore, it is important to realise that temperature, time of the entry, quantity, rainfall and soil composition influence the efficiency of the inhibitors and the duration of the effect observed.

Do it better ...
Refine slurry instead of disposing of it

Questions and answers concerning slurry

What can be done when the slurry foams?
Occasionally slurry starts to foam without there being any obvious reason for this. This can be very unpleasant when the slurry container is almost full up. The foam comes about through the fermentation of easily soluble carbohydrates. Especially in the case of undigested
crushed corn from maize silage, there is a particularly high risk.
Using plocher liquid humus creates a decomposition milieu which counteracts unwanted fermentation, together with all the accompanying benefits for animal housing climate, soil and plant quality. Without microbiology, decomposition cannot function.
In connection with the decomposition milieu of slurry, the following is important: Do not add germicidal products to the slurry - upgrade your slurry with plocher liquid humus! Furthermore, you can positively support the metabolism and feed conversion with the PLOCHER livestock supplements and the plocherkat for water vitalisation, and thus open up further performance resources for your farm.

Why is plocher liquid humus available on different carrier materials?

Calcium carbonate:
is our standard product for any situation!

Bio-molasses:
is what we recommend for intense occurrence of floating layers!
For use with spraying and fogging equipment. Farmers prefer bio-molasses because it does not separate from water when spread.

Is slurry or manure treated with plocher liquid humus suitable for biogas plants?
Yes, for the following reasons it meets optimum requirements for this purpose
- homogeneous
- pH neutral
- nutrient-rich with enzymes and trace elements
- improved formation of acetic acid

Recommended application and dosage:
First application: 1.5 kg or 1.5 l per 100 m^3 slurry,
further applications: 5 g or 4 ml per LU/week

In the drainage channel without a floating layer:
Mix plocher liquid humus with plenty of water in a watering can, then distribute evenly over the channel. The effect is improved if 2/3 of the recommended volume is added at the beginning of the drainage channel.

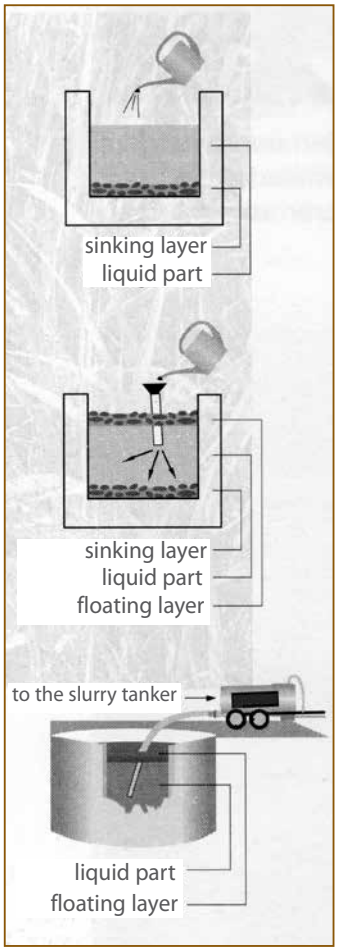
In the drainage channel with a floating layer:
Make with two holes per m^2 in the floating layers, then add the plocher liquid humus, diluted with plenty of water, to the liquid part of the slurry.

In the slurry pit:
Add plocher liquid humus, diluted in water, via the stirring equipment. If no stirring equipment is available, use a suction tube to penetrate the floating layer and add plocher liquid humus, diluted in water, through the tube. Continue until the slurry tanker is full, then pump content back into the pit. For large pits, repeat at several different places.

In the underground slurry pit and slurry collection channel.
Mix plocher liquid humus with plenty of water in a watering can, then distribute evenly over the empty channel or pit. Repeat every time after emptying.

Cubicles - application recommendation
First application: 3 g or ml/m^2,
per further application: 1 - 2 g or ml per m^2/week.
This ensures quick degrading of the bedding material in the slurry. Improved hygiene for the lying areas.

Please note:
Observation is important! The effect of plocher liquid humus becomes evident when bubbles begin to form in the slurry. Chemical contamination of the slurry (e.g. antibiotics) will delay the effect.



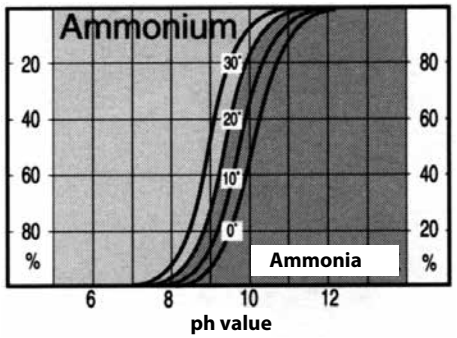
PLOCHER aerobic slurry does not burn plants

How does ammonia become ammonium?

Whether or not nitrogen in the lowest oxidation state occurs as ammonium or ammonia in water depends on the pH-value and temperature. Increasing pH-value and/or increasing temperature means that the concentration of ammonia also increases, with the concentration of ammonium decreasing accordingly. Conversely, a decreasing pH-value and/or temperature involves an increasing concentration of ammonium and a decreasing concentration of ammonia.

ph value	Ammonium %	Ammonia
6	100	0
7	99	1
8	96	4
9	75	25
10	22	78
11	16	84
12	0	100

The table shows the numerical correlation, valid for a temperature of 17°C.
It becomes very clear that at values lower than pH 6, it can be assumed that ammonia is no longer present. At pH 9, 25% of the ammonium has been converted to ammonia and the ammonium concentration is still at 75%. Above pH 12, the concentration of ammonium is 0%. In chemical terms the ammonium concentration is easier to determine than the ammonia concentration. If the ammonium concentration in mg/l and the pH-value of the water are known, it is possible to determine the ammonia concentration in mg/l.



Source: Andreas Schreiner: Chemische Untersuchung natürlicher Fließgewässer (Trier 1997)
(Chemical investigation of natural flowing water (Trier 1997))

The illustration shows the dependence on the pH value and the temperature. At a pH-value of 9.5, for example, the ammonium concentration at 0°C is 80%, and at 30°C it is 20%. With regard to the ammonia concentration the same figures apply in reverse order.
As ammonia is highly toxic to organisms, including fish, knowledge of the interdependencies described is particularly important because in stagnant waters (e.g. ponds) both the pH value and the temperature can change considerably in the day/night cycle. This also applies to slurry which is rich in aerobic bacteria: The temperature of the slurry should not exceed 17°C, the pH-value should be around 6.5 (slightly acidic).

One of the effects of using plocher liquid humus is achievement of a pH-value of approximately 6.5.

Source: THE PLOCHER ENERGY SYSTEM
Impetus for a rethink

Working in harmony with nature is not only ecological, it is also always economical!
This is why PLOCHER products are a worthwhile investment for all forms of management, right from the beginning!

PLOCHER®
WER RECHNET, NIMMT PLOCHER.
NATÜRLICH!

Added value through stabilisation of nitrogen

Make consistent use of your business's own resources!

Based on the example of plocher liquid humus (1.5 kg/100 m^3) this represents profit of 16 cents* per m^3
• Analyses show
an average increase of 0.5 kg/m^3 in decomposed slurry:

0.5 kg N/m^3 x 1.07 €/kg N = € 0.54* per m^3
Costs: plocher liquid humus = € 0.38* per m^3
= profit of 16 cents per m^3
*incl. VAT /10 kg container/valid: 09.20

Due to the **natural nitrogen stabilisation, the higher nitrogen content remains** available for the plants and fully covers the costs for plocher liquid humus! Because the less nitrogen escapes into the environment, the more is available on the field for plant nutrition.

Further profit as a result of:
• Animal housing hygiene, odour minimisation, fly reduction
• Homogenisation
• pH-regulation
• Humus formation
• Optimised fertiliser effect through nitrogen stabilisation
• Foliar fertiliser and plant vitality
• Basic fodder provides the nutrients for performance
• Savings in work time and energy costs
• Incl. environmental protection (soil, water and climate/emission)

Visit us - we look forward to meeting you!

EuroTier® First in animal farming. AGRITECHNICA® THE WORLD'S NO. DLG Feldtage® Treffpunkt Pflanzenbauprofis

New: Animal housing air composting with PLOCHER® AIRA

In addition to the PLOCHER vital livestock concept, the individual livestock supplements, water vitalisation, aerobic slurry and animal housing manure treatment (www.fluessighumus.de), are now supplemented by the possibility to compost animal housing air with PLOCHER® AIRA.

The air in the animal housing is sucked in at various points and directed through the PLOCHER® AIRA. 100 ml **plocher liquid humus me** per day is added to the fine spray (water consumption c. 1 l/day) and the air is then directed back into the animal housing.

The air remains within a closed circuit and is not released outside.

This is an extremely economical procedure because no air needs to be added from outside. As a consequence, in piglet housing for example, expensive heating of the air in winter is not necessary.

The technical operating data speak for themselves:
voltage: 230 V
power: 255 W
Volumetric flow: c. 1500 m^3/h
Daily consumption:
c. 1 l water
(vitalised with the plocherkat) and
100 ml plocher liquid humus me
Photo: Roland Plocher and farmer Jochen Schmid

Practical implementation of animal welfare:
A pleasant atmosphere for humans as well as animals thanks to the PLOCHER health concept

Treat valuable slurry correctly

Slurry and dung from animal housing are the farm's own fertilisers. In order for them to develop their full potential, correct storage and treatment are required.

"Decomposed manure is farmer's gold pure" according to a German saying. There is certainly a lot of truth in this short statement. Unfortunately this topic is very badly neglected in agricultural training. The pioneers of compost and slurry management, who were intensely involved with the topic, have more or less fallen into oblivion. A glance at the soil or the frequently described "slurry flora" very quickly reveals, however, whether decomposition processes are taking place or not.

What does decomposition actually mean?
Slurry is a valuable, "in-house" production resource and so it is surprising why slurry can become a problematic product. Every year, when the farmers take the slurry out onto the fields, people immediately complain about the unpleasant smell. "But that's just the way it is in the country ..." is the response!

And it is not fair to consider the slurry as the primary reason for this problem. The sole reason why slurry becomes a problematic substance ensues from its incorrect transformation through composting processes. These always set in when there is a lack of oxygen, i.e. fermentation under anaerobic (without oxygen) conditions.

During the anaerobic transformation of slurry foul-smelling gases develop, including hydrogen sulphide and ammonia, as well as methane gas and nitrous oxide (laughing gas), which play a significant role in creating the greenhouse effect.

In the decomposition process (aerobic) no unpleasantly smelling gases ensue. In the decomposition milieu carbon dioxide is formed by the exhalation of the aerobic biology. In combination with water, this transforms into carbonic acid. This causes the pH-value to shift in the direction of neutral. This, in turn, leads to ammonia being bound in the body proteins of the decomposition biology and transformed into ammonium accessible to plants. Decomposed slurry, consequently, can be spread as foliar fertiliser, without negative smell, just at the correct time concerning vegetation - i.e. when it suits the crop best.

The aerobic conversion of slurry and manure is therefore of crucial importance for the fertility of the soil. In a decomposition process there is no basis of existence available for pests. Putrefaction processes, on the other hand, encourage flies to lay eggs. Putrefaction processes also provide a breeding ground for germs and parasites which cause diseases. The decomposition biology of the soil cannot function with stinking, putrescent slurry or manure. The consequence: Danger for crops and animal stocks.
Decomposition processes thus promote life. They are a prerequisite for humus formation. Trace elements, vitamins, enzymes and natural antibiotics are developed which protect the soil and/or the plant against damage. The best basic fodder is the guarantee for successful livestock farming. Because the quality of the basic fodder can only be as good as the soil in which it grows.
Fertilising means: Providing nourishment for life in the soil! Even Aristotle described the soil as the stomach/intestines of the plant. Our digestive tract fulfils tasks comparable to those of the soil. And just as in our case, the biological activity in the soil cannot cope with putrefaction!
So"feed" the biological activity in the soil appropriately with decomposed slurry, compost, surface composting (mulching) so that the soil can fulfil its role as a buffer, water regulator as well as storage place for nutrients. The success is clearly reflected in the livestock: healthy animals from healthy basic fodder!
Promotion of decomposition is also an active form of environmental protection. Ground water and air are not polluted because no environmentally damaging gases are formed and the nutrients in bound form are available to the plants.

Value-for-money fertiliser
To react to this and contribute to creating awareness for natural cycles in agricultural enterprises is also a worthwhile investment for every farmer! The farm's own "fertiliser production" is extremely economic - and sustainable at the same time, environmental protection included. Or, as expressed in German vernacular: "Decomposed manure is farmer's gold pure!"

Monika Junius Dipl. Ing. (FH) agr.

Observations of PLOCHER-treated slurry

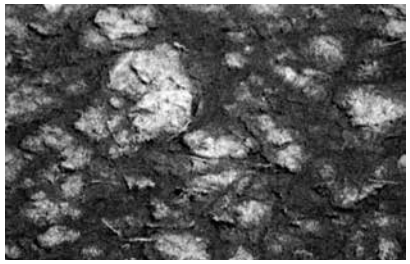
So how do we actually apply the PLOCHER powder? We asked the users to explain it to us. You need to dissolve the specified amount (1.5 kg per 100 m^3), ideally in a watering can, and spread it over the floor slats in the animal housing. The unpleasant smell in the animal housing subsequently improves. This is most noticeable in pig housing. Here, 17 ppm of ammonia have been recorded prior to spreading, and three days later just 4 ppm were recorded.

The second effect: The slurry already liquefies in the drainage channels, which means no more blockages in corners or at the drain outlet. Interestingly, crusts on the concrete walls completely dissolve after several weeks - these relics significantly reduce flowability, however, so it is essential to rinse with water. But, in future, no crusts will ever form again on the walls.
Let's follow the sludge into the container. In many cases, there is a floating layer which may be more or less thick in its consistency. This will also disperse, although the process can take several months. In most cases a considerable reduction can be observed after just four weeks. Nevertheless it has been ascertained that, in the case of external containers, a fine layer (2 - 5 cm) always remains due to oxidisation with air. This has no relevance at all for the spreading process. It was also reported to us that layers which were as much as one metre thick took six months to disperse - but when they did, they disappeared completely. Particularly interesting is what occurs inside the container. The top layer is usually sealed and dry. Once PLOCHER has been used, cracks will form in this layer, and vein-like formations which fill with liquid become clearly noticeable. Subsequently the conversion activity can be recognised in the form of bubbles in various sizes. Foam will form, particularly around the edges. Again, there is a very evident reduction in the level of unpleasant smell.

Treatment of containers

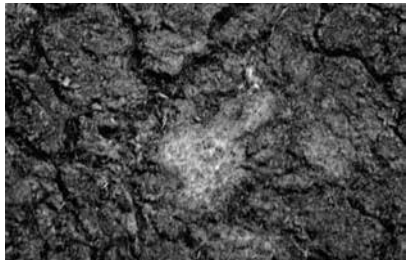
Slurry pits and containers are best treated as follows: Pump the liquid part of the slurry into a slurry tanker until it is full. Prior to this, the required amount of plocher liquid humus is to be placed within the tanker. During pumping, the powder is distributed around the tanker and mixes with the liquid. Now the liquid is pumped back into the container or pit. If you possess stirring equipment: a quick stir can be quite beneficial during this process. Usually, a significant increase in bubble activity on the surface can be observed after three to five weeks.

Source: THE PLOCHER ENERGY SYSTEM
Impetus for a rethink



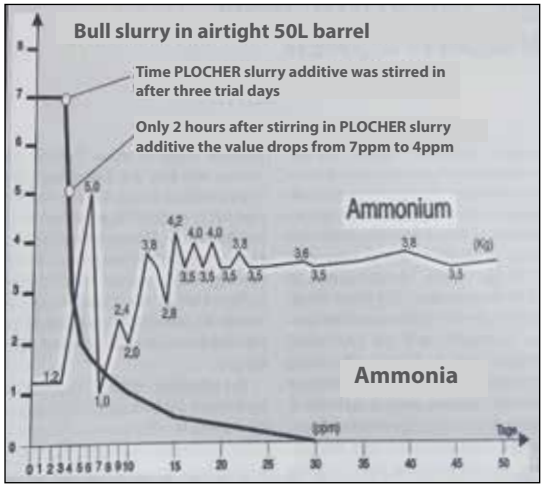
A normal floating layer on bull slurry. In the round concrete blocks, it closes like a lid. No oxygen can penetrate; underneath it putrefies and the grand-scale gas formation begins.

This picture was taken at -15° C. The floating layer is now only thin, and foam formation can be detected at the edge. So is this a transformation process even at these temperatures?



The floating layer begins to break up, trickles of liquid can already be clearly detected.

The second indication of the PLOCHER effect: formation of bubbles, as here in a size of 3 to 5 cm.
Sometimes accumulations of bubbles the size of the palm of a human hand appear.



Interesting measurement series:
The Draeger measuring device shows precisely the conversion of ammonia to ammonium:

After just 2 hours the ammonia value drops from 7 ppm to 5 ppm. After a few days, it becomes increasingly negligible. Ammonium, on the other hand, increases constantly.

Source: The PLOCHER ENERGY SYSTEM - Impetus for a rethink

Preserving slurry with sulphuric acid?!

In 1927, the cheese manufacturers in Emmental therefore made it a firm condition that livestock were not to be fed on fodder harvested beneath fruit trees where toxic substances had been sprayed during the vegetation season. Conserving slurry with sulphuric acid, iron vitriol* or direct addition of superphosphate is prohibited all year round. This restriction was imposed because it had unfortunately been ascertained that such toxic substances found their way into the milk. It goes without saying that such milk could not be used to produce top-quality Emmentaler cheese.

Source: Johannes Schomerus, Agricultural Council for Fruit Cultivation, Dresden
Producer of Emmenthaler cheese 1927 see section on Slurry and Sulphuric Acid

* Iron vitriol was the first source for larger quantities of sulphuric acid

Warning: When handling sulphuric acid, complete protective equipment and trained personnel are a fundamental requirement! Incorrect handling can lead to serious injuries, e.g. due to the strong corrosive effect on skin, eyes and respiratory tract!

ATTENTION

Problematic in this procedure, however, are the work safety issues in connection with handling the sulphuric acid, the release of hydrogen sulphide when adding the acid (Dai and Blanes-Vidal, 2013) and the formation of foam. Furthermore, very little is known to date concerning the effects of acidified slurry on the concrete used in slurry containers and cellars. (Questions from the project of the State Research Centre for Agriculture)

It couldn't be more simple!
PLOCHER products pose no risk whatsoever for humans, animals or the environment!
(See page 18 letter from Uni Sherbrooke)

Aerobic treatment of cattle slurry with plocher liquid humus!

Comparison of ammonia values (NH_3):

The measurements were carried out directly over the slats at 10 different spots throughout the entire animal housing. The measurement device was developed for vets, agricultural authorities and companies.

PLOCHER animal housing
NH_3: min. 2 ppm, max. 9 ppm
No stirring required!

CONTROL animal housing
NH_3: min. 7 ppm, max. 19 ppm
Slurry needs to be stirred 2x per week:
Peak figure during stirring: NH_3: 37 ppm !

Further significant analyses concerning the effect of plocher liquid humus:

1. Plant tolerance
The laboratory cress test clearly demonstrates the very good plant tolerance of liquid humus:

Dilution level 1: 10	DL 1: 30	DL 1: 100
2	**3**	**3**

The growth of the cress during the vegetation trial is to be evaluated as follows:
0 = no growth, 1 = poor growth,
2 = normal growth, 3 = good growth

2. Humus formation
Liquid humus C/N proportion = 32
Evaluation of the measuring result:
> 20: Permanent humus, this makes an important contribution to sustainable humus formation and determines the fertility of the soil!
< 20: Nutritive humus, is broken down quickly in the soil

3. Low gas losses
pH-value: 6.78 (see table p. 22)
Devolatilising potential: 17.94 ppm
Evaluation:
Low gas losses - see average value:
Median value of all measuring values to date: 32.44 ppm
(Valid 28.04.2020, Hessian State Laboratory)

Plus observation at the farm:

Grass grows on the droppings from the manure slider - a simple indication of the aerobic decomposition milieu
created by plocher liquid humus and its growth promoting properties!

"Is there such a thing as slurry which doesn't stink?"

In Überlingen the residents were exposed to the stink of slurry. Frau Jäckel didn't simply want to complain about it, she also wanted to find a solution. At PLOCHER she found what she was looking for, and now the successful outcome is that both farmers and residents are happy! The Südkurier newspaper published a report on 17.05.2011.

Frau Jäckel in the TV interview: "Is there such a thing as slurry which doesn't stink?"

Scan - video:
"Slurry which no longer stinks"

What really stinks as far as the farmers are concerned, is the statement in the newspaper article as well as in the SWR feature made by LVVG Aulendorf: "Just because the farmers spend a lot of money, this would have an educational effect and therefore the slurry would not stink anymore."

Anyone who is careful with their money uses PLOCHER - see page 23!

Soil compaction and slurry

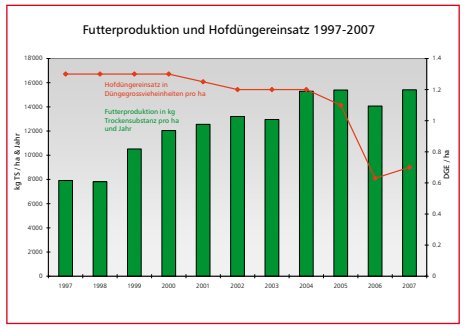
Slurry, according to the recommendation, should be spread when the weather is dull to rainy and when it can be worked into the soil immediately afterwards. It should never be spread when the weather is nice and sunny because under these conditions the emissions are too strong and the slurry has a negative effect on the plants. The actual problem is that, under these conditions, the earthworms are in the upper layers of the soil.
The consequences, when the slurry is not in a state of decomposition, are devastating for the earthworms. The soil structure is directly influenced, however, by the earthworm population.

There are already areas of arable soil in which earthworms have become completely extinct.
Source: "Secrets of fertile soils" (Erhard Hennig)

Optimisation of an organic farm in Switzerland Report 2007

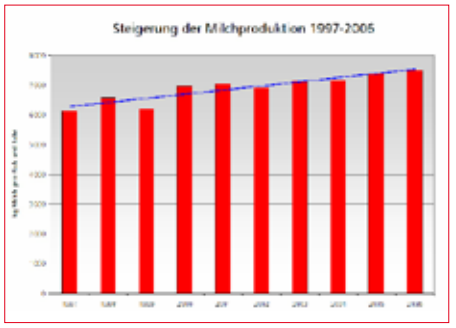
The agricultural enterprise of the Hunziker family has been managed in accordance with the Swiss BIO standard for more than 30 years.
In 1993 the farm manager used ROLAND PLOCHER® integral-technik for slurry treatment for the first time. Over the next 14 years all PLOCHER agricultural products were used and, in this context, the farm also served as a trial farm for the development of new products. The 17 ha enterprise keeps 12 - 14 dairy cows which provide the manure for the farm's own fodder and vegetable production.

Since 2002 the farm has not bought in any additional fertiliser. On the contrary, they have sold some of their own manure to other farmers.



Fodder production (green bars) and use of farm's own manure 1997 - 2007. The fodder production per surface and year could be virtually doubled from c. 8'000 kg to c. 15'000 kg dry substance per annum. In this context the quantity of the farm's own manure used dropped from 1.3 DLU to 0.7 DLU per ha.

In a bench-marking project carried out by the Swiss University for Agriculture*, the milk production was found out to be the most efficient in this category.



Increase in milk production 1997 - 2006. Over a period of 10 years, the quantity produced per cow increased from a good 6'000 kg per annum to c. 7'500 kg. The basic fodder performance amounts to a proportion of 94%

** Diploma dissertation of Ing.-Agr. HTL Thomas Haas: "Benchmarking for costs in milk production" Swiss University for Agriculture, Zollikofen 2004.*

Farewell to slurry flora - example: Buttercups

Correct slurry management is decisive for quality basic fodder
A great expanse of yellow blossom as far as the eye can see. These are not rape crops - they are meadows full of buttercups! The buttercup has become a dominating plant in many pastures. But fundamentally these plants render such pastures useless as basic fodder. Because the buttercup is classified as a toxic plant.

- The meadow buttercup (recognisable by the leaves) is poisonous in green and silage fodder.

Causes:

- Soil compaction, overfertilisation (nitrogen-loving) and excess use as well as sward damage (gap-fillers).

Consequences for animals if consumed in large quantities:

- Diarrhoea and blood in the urine
- Milk: yellow-reddish, bitter taste.

Such a situation makes evident just how important correct slurry management is for high-quality, biologically valuable basic fodder. Feed (fertilise) the soil life correctly. The slurry and compost additives by PLOCHER activate the desired decomposition process immediately at source, i.e. already in the animal housing. Manure from your own farm is thus transformed into valuable complete fertiliser – a prerequisite for sustainable, economic success and quality incl. protection of the environment and groundwater. PLOCHER aerobic slurry becomes liquid humus, compatible with plants and the soil, which means that appropriate and diverse pasture growth ensues, as well as firm turf. Farmers observe how, after just a short time, pastureland which has been fertilised with PLOCHER aerobic slurry is accepted by animals.

High-quality basic fodder on the pastureland of organic farmer B. Hunziker – treated naturally with PLOCHER

Treating the causes rather than tackling the symptoms using the example of dock

The most persistent grassland weed is **dock.**
Overfertilisation, soil compaction and damaged turf are the cause. Just two dock plants per m^2 can represent a green mass proportion of as much as 40% in the fodder. By application of a PLOCHER product, as PLOCHER users unanimously agree, a great deal can be achieved. For example, plant and soil compatible doses of PLOCHER aerobic slurry = liquid humus (c. 10 m^3/ha/dose), soil life is supported and the turf becomes firm. The consequence: Nutrients remain in the surface soil, the dock no longer receives sufficient nutrients from the subsoil and is therefore permanently weakened. The dock beetle is attracted by the change in the flow of the dock juice and thus also contributes to the decline of the dock. This gives undergrasses and clover a chance to grow again. A natural, thick turf develops - without any use of herbicide, without a great deal of additional work, without any complementary seeding and without additional costs!

Here are two examples (see photos) of agricultural enterprises which, in a completely natural way, succeeded in getting rid of dock from their grassland
by using PLOCHER slurry and/or PLOCHER compost additives and PLOCHER digestate activator (activation of soil biology/surface composting). This is shown clearly by the increased yield and the high quality of the fodder = basic fodder provides the nutrients for performance = animal welfare!

Detailed report: Santer Helmuth – South Tyrol, Tel: +39 335 6740446,
www.santerh.it

Rough-stalked meadow grass - The soil decides what grows in it!

As the name already indicates, this "rough grass" makes no contribution whatsoever to the fodder quality. It therefore does not contribute to the profitability of the farm either. Rough-stalked meadow grass is a typical gap-filler and thus takes on nature's important task of repairing disturbed turf. This enables the soil to regenerate and, gradually, space is created again for high-quality feed grass. This "rough grass" is therefore actually a clear sign for the farmer that the soil environment is disturbed!

Treating causes rather than tackling symptoms is now required in grazing management, by means such as improving the soil condition through biological tillage by using aerobically treated farm manure as well as surface composting of faeces and mulch. Aerobic PLOCHER-
land management supports root growth and thus the firmness and trafficability of the soil. Good advice is highly beneficial here, but not expensive because the aerobic treatment of slurry with plocher liquid humus costs c. 5 € per LU/annum - and includes animal welfare considerations as well as ground water and emission protection.

The soil decides what grows in it! Farm manure treated with PLOCHER slurry, PLOCHER compost and PLOCHER digestate additives becomes foliar fertiliser and promotes humus formation. The PLOCHER soil treatment and/or PLOCHER plant products can be spread together with the manure in order to activate biological activity and promote photosynthesis. Active soil life is a guarantee for tasty fodder quality, because active soil biology supplies all nutrients required for profitable pastureland! If roots can breathe, the conditions are also good for various clover varieties to develop bacteria radicola, consequently enriching the fodder ration with valuable protein. If basic fodder provides the foundation for performance, the animals are well and business is profitable.

Jochen Schmid explains the practical possibility of spreading plocher liquid humus me using a spray system.

A practical example:
Farmer Jochen Schmid has been applying the PLOCHER aerobic land management system for years. This is the result of his hay sample, tested by AG FUKO e.V.:

Analysis No: **2019-91081007** **Sample received:** **08.11.2019**
Sample type: **Hay** **Description:** **hay, 2nd cut**

	Method	Result in fresh matter	Result in dry matter	Target values for cattle	Unit
Dry matter	*VDLUFA III 3.1 (1976)*	**93.7**		> 85	%
Org. dry matter	*Calculated*	86.4			%
Crude ash	*VDLUFA III 31.2*		7.8	< 10	%
Sand	*Calculated*		< 1.0	< 2.0	%
Crude protein	*VDLUFA III 31.2*		139.1	< 120	g/kg
True protein	*VDLUFA III 31.2*		-		%
Digestible crude protein	*according to GfE(2003)*		100.4	< 80	g/kg
Usable crude protein	*according to GfE(1997)*		134.3		g/kg
Ruminal nitrogen balance	*according to GfE(1997)*		-		g/kg
NFC	*Calculated*		-		%
Crude sugar	*VDLUFA III 31.2*		12.8	< 10	%
Fructans	*VDLUFA III 31.2*		4.5		%
Crude starch	*VDLUFA III 31.2*		-		%
Crude fat	*VDLUFA III 31.2*		2.4		%
Crude fibre	*VDLUFA III 31.2*		23.3	27 - 32	%
NDF_{om}	*VDLUFA III 31.2*		42.4		%
ADF_{om}	*VDLUFA III 31.2*		29.0		%
ADL	*VDLUFA III 31.2*		-		%
Structure value	*according to De Brabander (1999)*		2.9		
ESOM	*VDLUFA III 31.2*		-		%
Gas formation	*VDLUFA III 31.2*		52.7		ml
Energy	*according to GfE(2008)*		10.3		MJ ME/kg
	Weißbach et al. (1996)		6.2		MJ NEL/kg
	according to GfE(2003)		10.1		MJ DE/kg

Examples for use of PLOCHER slurry additive at source in the animal housing

plocher liquid humus for slurry treatment is used at source in the animal housing and provides a more pleasant climate for animals as well as humans, a significant reduction of pathogenic germs as well as free flow channels.

We spread plocher liquid humus (4 ml/LU/ week) using a cold fogger and are thrilled about the result:
"A great climate in the animal housing, **top quality aerobic slurry** and improved fattening performance all speak for themselves!"
Rainer Franz, pig farm in Mulfingen - Ochsental.

Further examples of usage:






The farm's own fertiliser production:

Flowing slurry, no floating layers, excellent climate. The employees are convinced of the effect of plocher liquid humus.



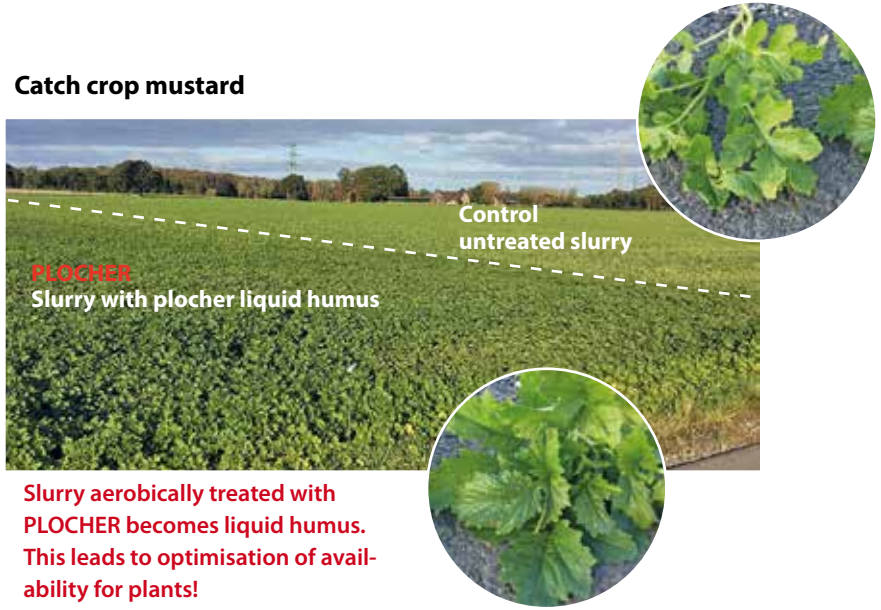

Pig slurry - added value with plocher liquid humus

At the conventional agricultural pig farm of Robert Strangemann in Kirchhellen, the slurry was tested before and after the use of plocher liquid humus.

Scan - video:
"PLOCHER usage in pig housing"

		CONTROL		PLOCHER	
Test parameters	**Unit**	**in fresh matter**	**in kg/m³**	**in fresh matter**	**in kg/m³**
Dry matter	%	4.0		4.3	
Nitrogen (N) total	%	0.34	3.43	0.42	4.15
Ammonium-N (NH 4-N)	%	0.28	2.77	0.37	3.69
Phosphorous (P205) total	%	0.18	1.84	0.22	2.20
Potassium (K2O) total	%	0.27	2.71	0.36	3.61
Magnesium (MgO) total	%	0.11	1.08	0.11	1.13
Calcium (CaO) total	%	0.21	2.10	0.21	2.12
Sulphur (S) total	%	0.029	0.290	0.03	0.34

Catch crop mustard



Slurry aerobically treated with PLOCHER becomes liquid humus. This leads to optimisation of availability for plants!

Strangemann maize farm

The best distribution technique can only be effective if the slurry does not stink and putrefy.

Slurry treated aerobically with plocher liquid humus promotes soil life and makes an important contribution to sustainable humus formation!

All in one go:
plocher humus soil me (soil treatment) is sucked into the slurry tank and spread together with liquid humus (slurry treated aerobically with plocher liquid humus at the animal housing).

Subsequently it is hoed into the soil.

The soil probe shows:
no soil compactions!
This means ideal circumstances for good root growth and uninterrupted water regulation.

Field report by Aleks Gamza
a.gamza@plocher.de

PLOCHER®

UNIVERSITÉ DE SHERBROOKE

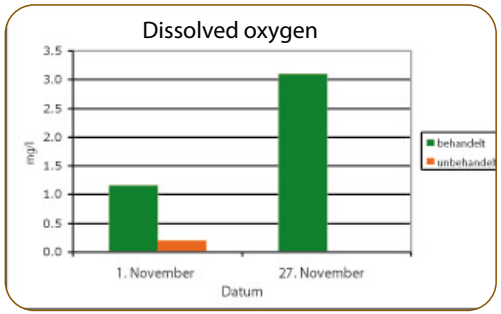
Verifying the effects of slurry treatment in Canada

Influence of PLOCHER slurry additive on dairy cow liquid slurry

Lab analysis results

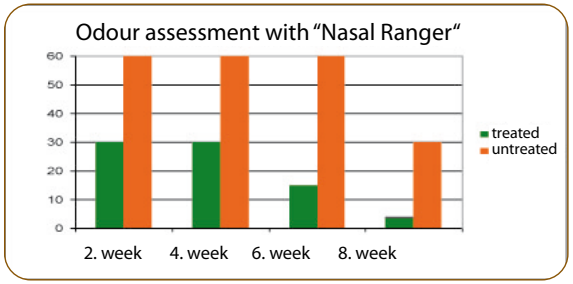
Dissolved oxygen

In early November the control slurry contained only 0.2 mg/l of dissolved oxygen, whereas the PLOCHER treated slurry contained almost 1.2 mg/l. At the end of the month, there was no dissolved oxygen at all measurable in the control slurry. The treated slurry to which an additional 30 g PLOCHER slurry additive had been added on 14 November, on the other hand, contained c. 3.1 mg/l. The existence of oxygen in the PLOCHER treated slurry permits the development of aerobic bacteria, which is a prereq-uisite for the desired decomposition process.



Odour

Odour assessment was carried out with a device called "Nasal Ranger".
It began 2 weeks after the start of the test and comprised a total of 4 surveys, which were carried out at intervals of 2 weeks.



Control

PLOCHER

Observation of development of the two slurry samples led to the following result:

- yellowish colour
- thick, muddy and inhomogeneous consistency (non-decomposed straws)
- many larvae
- outgassing (gas bubbles)

- dark brown colour (indicating good composting)
- thin and homogeneous consistency (straws decomposed better)
- no larvae
- no forming of gas bubbles

Conclusion:

In comparison with the control sample (untreated), liquid slurry treated with PLOCHER slurry additive shows:

- better homogeneity, flows better
- less odour
- fewer insect larvae
- fewer pathogenic bacteria
- microbiology that is more beneficial for soil life

The trials determined that the liquid slurry treated with PLOCHER slurry additive reflects an advanced stage in the decomposition process. The control sample (untreated), on the other hand, shows a development which reflects loss in value (putrefaction).

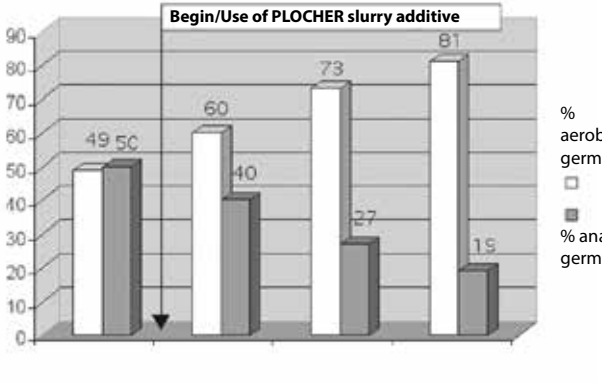
The effects of plocher slurry & liquid manure on pig slurry

From the EU report "Profitability and Environmental Protection"

This three-year 5b EU project was concluded in November 1999. Execution, control, administration and evaluation was conducted by the Commission for Agriculture and Horticulture Meetjesland (Belgium).
The total germ count in the slurry declines considerably. This also has a sensational effect on the pathogenic, disease-causing germs in the slurry: Reduction of pathogenic germs in the slurry through treatment with PLOCHER slurry additive:

- Colibacillus: 99.4% reduced!
- Enterococcus: 86.3% reduced!
- Clostridium perfringens: 72.0% reduced!

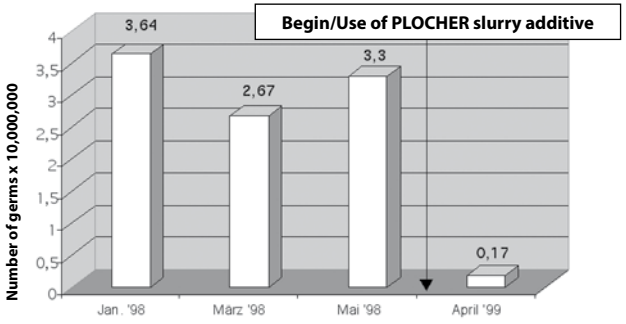
Development of aerobic & anaerobic germs in pig slurry



This has an effect on the animal's quality of life, directly at source in the animal housing - and indirectly through fodder quality!

Pathogenic germs do not return to the animal housing through the feed.

Development of the total germ count in pig slurry (pre-fattening phase)



Quote from the EU report:
"This is where profitability and environmental protection meet."

Field tests of the Agencia de Extención Agraria, Spain

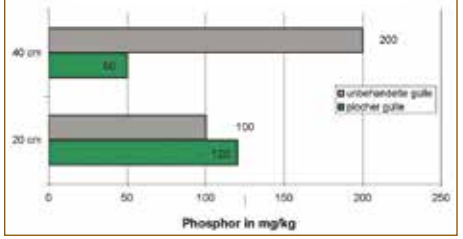
Distribution of nutrients in slurry-treated soils

An investigation on 26.5.1999, in collaboration with the Agencia de Extención Agraria, Spain, demonstrates the distribution of nutrients in soils which were "fertilised" over a period of many years with anaerobic, putrescent, stinking slurry.

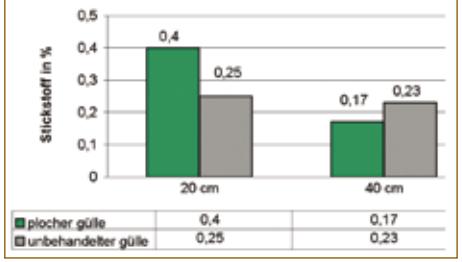
These soils were subsequently fertilised with slurry treated with PLOCHER slurry additive, i.e. aerobically developed, non-stinking slurry, spreading the same volumes and at the same intervals.

Exactly one year later (on 24.05.2000), new measurements were taken from the same soils at the same spots.

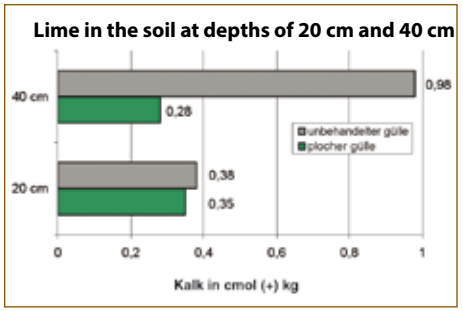
Phosphorous in the soil at depths of 20 cm and 40 cm



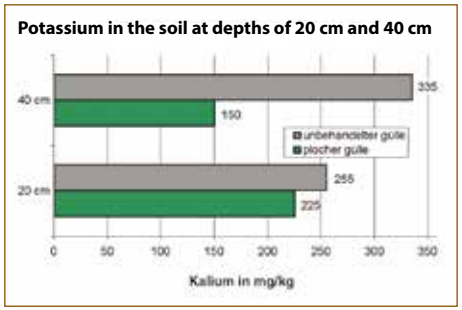
Nitrogen in the soil at depths of 20 cm and 40 cm



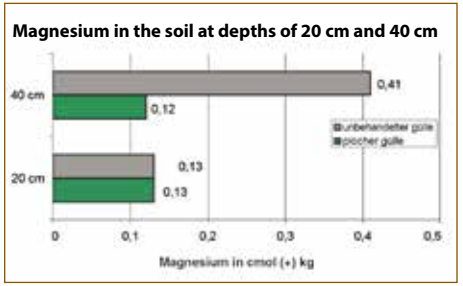
Lime in the soil at depths of 20 cm and 40 cm



Potassium in the soil at depths of 20 cm and 40 cm



Magnesium in the soil at depths of 20 cm and 40 cm



The results are informative and significant, both for success in plant production and for water management, i.e. for the profitability of agricultural enterprises and for keeping our ground and drinking water clean, in addition to our lakes, natural as well as man-made ponds and rivers.

Pilot project Bellacher Weiher (Bellacher pond) in Switzerland

18 farmers cultivate approximately 160 hectares of land in the water catchment area of the Bellacher pond. To stop overfertilisation, which also leads to sedimentation and siltation of the water, the farmers are given three different special products which they add to their slurry and manure and also spread on the ground. For a five-year trial period, these products are paid for by the community of Bellach. The project is supported by an environmental scientist who monitors the degree of success.

Original situation: overfertilised pond in 2004

Bellacher pond in 2017

Gentle remediation phase I (2004 - 2007)
Activation of natural regeneration processes in the pond with the PLOCHER system
• installation of plocher bio-catalysts
• spreading of the PLOCHER product, every 3 weeks c. 2 g/m²
Results phase I:
It was possible to stop growth of the sedimentation layer
• Problems with algae were still present, however

Phase II: Planning the involvement of agriculture
Prior to the agricultural programme:
Water-soluble fertiliser salts from untreated slurry and mineral fertiliser are distributed. Whatever cannot be absorbed by the crops, finds its way into the Bellacher pond, where it causes algae growth.
With the agricultural programme:
Instead of the plants, the soil is fertilised. Soil life makes nutrients accessible for the plants. Virtually no fertiliser salts reach the Bellacher pond!

Active groundwater and water protection: achieve changes in the milieu

Photos: Federal Office of Topography – swisstopo

The Bellacher pond project is an excellent example of collaboration between farmers and water management. By using PLOCHER products both in the animal housing and on the field,

SLURRY:
plocher
liquid humus
First dose: 1.5 kg per 100 m³ slurry
• every week 5 g/LU with the watering can in the drainage channels

BEDDING MATERIAL:
plocher
compost & manure
• 40 g per m³ manure
• 5 g/LU per week

SOIL:
plocher
humus soil me
• 2x yearly on all areas

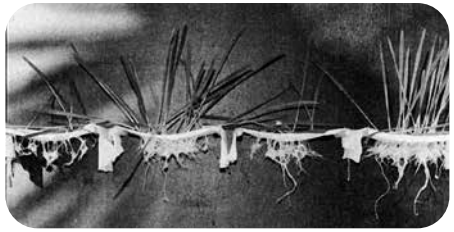
the heavily contaminated Bellacher pond could develop back into an attractive recreational area!

You can find more detailed information on gentle pond remediation at www.bellacherweiher.ch/forschung

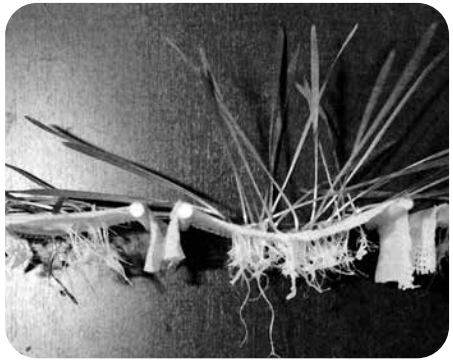
The Kutschera test

Altered root growth of plants fertilised with slurry

Professor Dr. Kutschera and her colleagues have developed a very informative hydroponics test method. Altered root growth of plants fertilised with slurry was to be investigated further, particularly with regard to side effects that are harmful to roots. Because in holistic terms, root development is the most important issue. The still continuing trend towards maximum yields has pushed the importance of root mass into the background, however. In the test at the Institute for Bioenergetics in Kinsau, carried out according to the exact guidelines of the so-called Kutschera test, the root growth of oats was **stimulated in a quite remarkable way by PLOCHER slurry additive.**



Differences in root growth. Far left H_2O - control. Left H_2O + plocher slurry & liquid manure. Right a slurry product. Far right the same slurry product + PLOCHER slurry additive.



A significant difference in the roots. Left H_2O - control, right H_2O + PLOCHER slurry additive.

Phytosociological Institute
PROF. DR. LORE KUTSCHERA
A-9020 Klagenfurt/Kempfstraße 12
Ruf 0463 / 54461 Fax: 0463/54461

Scientists as well as practitioners have been trying for a long time to apply specific measures to prevent or at least reduce damage being caused to plant stocks by animal faeces in the context of livestock farming. Their aim has been to maintain the value of the faeces as a carrier of nutrients to as great an extent as possible. Exclusively at the Bundesanstalt für Alpenländische Landwirtschaft (Federal Institute for Alpine Agriculture) in Gumpenstein, as many as seven conferences concerning "Slurry Topics" were held between 1957 and 1985. Numerous experts from various parts of Europe participated.
The mixture of urine and faeces, referred to as slurry, is used frequently. At the Federal Institute in Gumpenstein, these oldest types of fertiliser were tested for the first time with the additional support of aquacultures. It became apparent that urine and slurry had a particularly harmful effect on the sensitive tissue of young roots. The part most strongly affected is the area behind the root cap-covered tip of the root, which is termed the elongation zone. Fresh slurry and fresh urine can harm the roots of pastureland grasses and clover types even when diluted 15-30 times and 40-60 times respectively.
Treatment of the slurry with the PLOCHER method resulted in a significant reduction to the damage. Also remarkable was the extensive homogenisation and liquefaction of the slurry as well as the reduction in smell to the point of no negative smell at all. Such features appear to be connected to significant stimulation of the activity of small organisms.
It would be very revealing to discover more about why the PLOCHER method creates these effects. With regard to agricultural practice and environmental protection, however, it is crucial in the first place that this method reduces harmful effects so significantly.

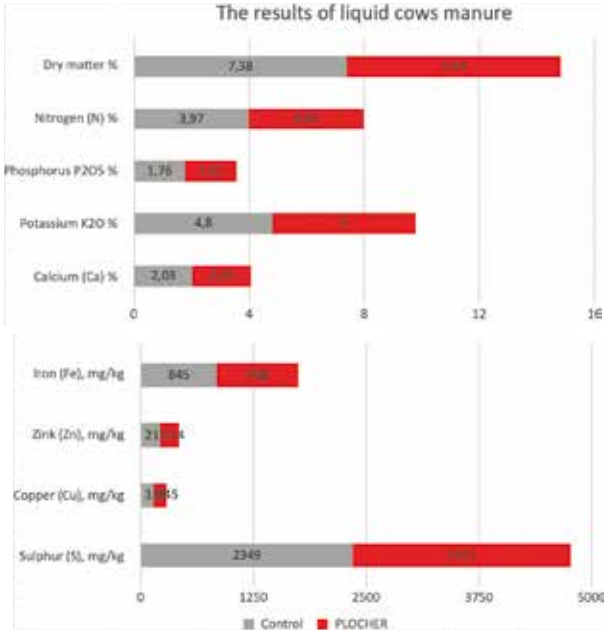
Lore Kutschera

Aleksandro Stulginskio universitetas

(Alexander Stulginskis University; Kaunas, Lithuania)

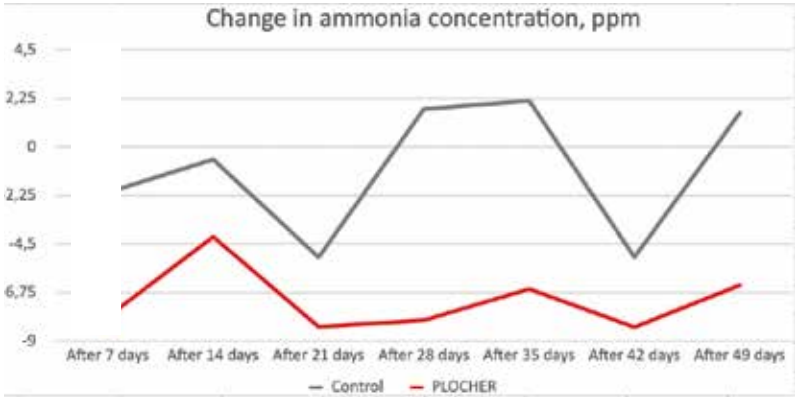
Research project with cattle slurry in Lithuania (2015 - 2016)

Test 1:
20 litres of cattle slurry (control) remained untreated, a further 20 litres of cattle slurry were treated with plocher liquid humus. After 28 days, the containers were opened again for the first time with the following result: There were many fly larvae in the control container, while in the PLOCHER-treated slurry, no fly larvae were present.
In the agrochemical research lab the following results were determined:
One tonne of PLOCHER-treated slurry contains:
• 0.5 kg more N
• 0.5 kg more P_2O_5
• 2.0 kg more K_2O



Test 2: Carbon dioxide test:
When spreading the slurry on the ground, 3.82 µmol $m^{-2}s^{-1}$ of carbon dioxide gas was recorded for the control slurry. For slurry treated with plocher liquid humus, this figure was 3.13 µmol $m^{-2}s^{-1}$.
This means that PLOCHER aerobic slurry has an 18.06% lower carbon dioxide emission.

Test 3:
The table shows the average ammonia concentration in the wind tunnel of the control cattle slurry and of PLOCHER cattle slurry.



More information: http://grynasbaltija.lt

Relliehausen Experimental Farm of the University of Göttingen

In 2008, we tested the products for slurry treatment and hygienisation (plocher liquid humus, plocher multi-purpose cleaner) from PLOCHER in two fattening cycles on the experimental farm for animal breeding and husbandry of the University of Göttingen in Relliehausen.

It became clear that the flowability and homogeneity of the pig slurry was greatly improved, there were reduced floating and sinking layers with a concomitant reduction in related pressure from flies.

Due to positive experiences with the slurry treatment and use of the plocher multi-purpose cleaner, we intend to continue using these products in the large-scale pig facility in future.
Arne Oppermann, Head of the experimental farm

More information:
Ingrid Rinkleff, Krebeck, PLOCHER distribution partner
www.plocher-krebeck.de

Information and consultation at EuroTier
Roland Plocher and Ingrid Rinkleff in discussion

The effect of negative ions
From the fields to our lungs: how ammonia poisons the air we breathe

Ions fill the air in huge quantities. They are electrically charged particles which are created when atoms and molecules, under the influence of strong energies, absorb or lose negative electrons. These energies originate from cosmic and ultraviolet radiation, from radioactive elements in rocks, from thunderstorms, waterfalls as well as wind, sand and dust storms. Every time we breathe, ions enter our lungs and are distributed to the cells via the bloodstream.
At times when the air pressure drops, and when the foehn is blowing, the air becomes excessively enriched with positive ions. Many people suffer under these circumstances and complain about being short of breath or experiencing joint pain; children become moody and unpredictable; crime and suicides increase.
Conversely, excessive levels of negative ions spice up the air with soothing freshness. People feel top fit and bursting with energy.
(from Readers Digest special edition)

High particulate matter pollution caused by agriculture
In agriculture, the combination of faeces and urine in animal housings leads to the formation of ammonia gas. From untreated slurry, large volumes of ammonia and nitrogen oxide evaporate into the air. They connect with water/moisture and develop into an aggressive solution which heavily afflicts all organic substances. We inhale the gases, and they irritate mucous membranes in the throat and nose as well as the lungs. Positive ions in the air impair excretion and expectoration abilities.

Measuring ions over permanent pastureland
According to Professor Eichmeier, Institute for Technical Electronics at the Technical University of Munich, in an exemplary investigation on the estate of Franz Hage in Rettenberg-Untermaiselstein, a two-channel ionometer was used for the simultaneous registration of the concentration of positive and negative small ions in the air. Earlier measurements taken over slurry containers and in animal housing had shown that, when using the PLOCHER system, the number of positive ions in the air was normal and the number of negative ions was always higher, to a varying extent.
On an area of Franz Hage's pastureland that was not treated with slurry, the number of positive ions varied over a period of ten minutes (measured at 2 o'clock in the afternoon) from a minimum of 500 to a maximum of 5400 ions/cm^3. The number of negative ions, measured at the same time, ranged between 1000 and 6200 ions/cm^3. The ion ratio was thus c. 1: 1. Subsequently, untreated slurry was spread on a part of the pastureland some 30 m away. For 20 minutes, positive ions amounted to 1600 - 5000 and negative ions to 4000 - 6200 ions/cm^3. The ratio of positive and negative ions was thus 1: 2.

Some time later, after a period of settlement, another measurement was taken at the meadow fertilised with untreated slurry:
Positive ions 20,000 - 30,000 per cm^3
Negative ions 20,000 - 30,000 per cm^3
Ratio 1: 1
After that, slurry treated with the PLOCHER system was spread on a section of the pasture. The measurements were:
Positive ions 1,200 - 30,000 per cm^3
Negative ions 10,000 - 95,000 per cm^3
Ratio 1: 4
It becomes clear that when using PLOCHER-treated slurry, the ion ratio shifts significantly towards negative ions, which are so physiologically important.

PLOCHER slurry is spread on the grassland.
The number of ions increases rapidly.

Source: THE PLOCHER ENERGY SYSTEM
Impetus for a rethink

Biologisch-Chemisches-Institut Hoppegarten (Mark) GmbH

Laboratory-supported practical test at the pig rearing farm of Landwirtschaftliche GmbH Vehlefanz

Between March and June 1997, a laboratory-supported trial was conducted with PLOCHER slurry additive at a pig rearing farm. The slurry additive was used in a selected animal housing and according to the recommendations for use.

Over a period of 6 weeks, the product was added to the slurry in the pig rearing animal housing. During this period regular laboratory tests were conducted in this animal housing which will hereinafter be referred to as Animal Housing A.

At the same time, regular laboratory tests were conducted in selected parallel animal housing in which the slurry was not treated. In the following, this facility will be referred to as Animal Housing B.

At regular intervals, slurry samples were taken and examined with regard to the following parameters:
- pH-value
- ammoniacal nitrogen
- Kjedahl nitrogen
- nitrate
- nitrite
- biological oxygen demand (BOD5)
- chemical oxygen demand (COD)

Animal Housing B - Control

Parameters	21.03.97	07.04.97	18.04.97	07.05.97
pH-value	6.9	6.8	8.6	9
Ammonium-N in mg/l	19.8	12.7	8.71	5.44
Kjedahl-N g/l	6.434	6.44	5.737	3.197
Nitrate in mg/l	17.01	15.02	11.63	10.21
Nitrite mg/l	0.97	0.79	0.53	0.49
BOD5 in mg/l	1.45	1.46	1.49	1.5
COD in mg/l	12.71	12.78	12.78	12.85
Ammonia concentration in animal housing air in ppm	21.2	21.2	21.6	21.2

Based on the available test results, it may justifiably be stated that the use of plocher liquid humus contributes to a considerable improvement of the animal housing climate in occupied animal housing facilities.

The biological-chemical-physical process in the slurry triggered by the product obviously causes binding of the ammoniacal nitrogen and other nitrogen compounds in the slurry, whereas in conventional slurry treatment the ammonia nitrogen and other nitrogen compounds escape as gases into the animal housing air and thus pollute the animal housing climate considerably with ammonia.

The available results, which are subjectively clearly perceptible and objectively measurable, show that the use of PLOCHER slurry additive already has a measurable effect after a relatively short period of 6 weeks, positively impacting the environment, nature and animal health.

Animal Housing A - PLOCHER slurry additive

Parameters	21.03.97	07.04.97	18.04.97	07.05.97
pH-value	6.7	6.6	8.7	8.5
Ammonium-N in mg/l	23.34	18.61	17.7	17.28
Kjedahl-N g/l	3.337	3.465	4.034	4.2
Nitrate in mg/l	9.02	8.05	14.5	15.24
Nitrite mg/l	0.26	0.53	0.57	0.47
BOD5 in mg/l	1.42	1.41	1.395	1.388
COD in mg/l	11.494	11.331	11.168	10.84
Ammonia concentration in animal housing air in ppm	15.1	14.6	12.8	**10.5**

plocher digestate activator

Additive for aerobic treatment of digestate from the biogas plant

Why aerobic treatment of digestate?
The root zone can be compared to our intestinal villi. This makes it easy to understand why no anaerobic digestate/putrefactive products should be introduced into this area.

On this topic, please also see "putrefaction and decomposition - The great antagonists" on page 9

Using digestate ECONOMICALLY!

The farm's own manure must make a valuable contribution to a nature-friendly circular economy.

Geprüft durch ECOCERT INPUTS

Recommended application and dosage:
First application: Add 1.5 - 2 l/100 m^3 with plenty of water to the liquid part of the digestate.
Regular applications: Add 1.5 - 2 l/100 m^3 according to the inflow quantity, on a weekly basis, to the liquid part of the digestate.

Floating digestate and sinking layers will disperse over time.

Cress test with separated digestate:

27.04.2014 *04.05.2014*

Digestate Control
After six months



seeds do not germinate

Project support Aleks Gamza

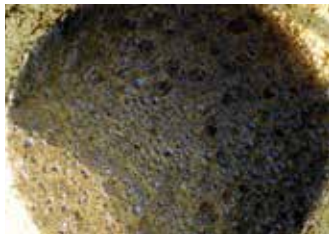
Digestate with PLOCHER since 02.02.14 composted in a compost heap



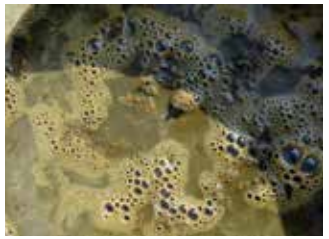
cress starts to germinate

Experiment in the Wollbrandshausen-Krebeck e. G. biogas plant, 1.8 MW, 3500 m^3 digestate storage

23.03.2012



Digestate with PLOCHER treatment on 05.01.12 + 06.01.12 with a total of 50 l plocher digestate activator me.



Digestate control untreated

Project support by PLOCHER distribution assistant Ingrid Rinkleff.

Significant differences:
- Homogeneous – solid matter completely metabolised
- Reduced stirring effort
- Higher gas yield
- Odour reduction

Treatment of digestate with plocher digestate activator me (ag 1271)
Biogas plant Wollbrandshausen-Krebeck eG, 37434 Krebeck, 1.8 MW, thermophilic

Continuous treatment of fermentation residue in the repository (depot 1)
Accumulating digestate per day c. 100 m^3 (maize/WPS/30% slurry cattle + pig)

Treatments:
1. 20.12.13 with 25 l for existing 1,400 m^3
2. 30.12.13 with 10 l
3. 06/01/2014 with 5 l
4. 13/01/2014 with 10 l
5. 20/01/2014 with 10 l
6. 28/01/2014 with 20 l
7. 03.02.14 with 10 l total 90 l for c. 6.300 m^3

Result:

- Significant reduction of the floating layer (photo 1) compared to the previous year (photo 2)
- Reduced stirring effort (10 min stirring/20 min break – otherwise 10 min. break)
- Feed reduced by 3 t per day (-7%) with identical gas yield
  (digestate depot is connected to fermenter and post fermenter via gas depots,
  so that gas formed in the repository can also be collected.
  Since the gas yield had already been close to the maximum capacity of the plant, feed was reduced accordingly. This improvement may also be due to a change in silage quality.)
- Solid matter yield in the separator currently 55 t in 24 h, previously 45 t in 24 h, potentially also due to sinking layers still to disperse in this depot.

For your information:
No treatment of the preliminary slurry tank, but 2 suppliers (c. 10%) with PLOCHER slurry (= liquid humus).

For results from previous year's projects see http://www.plocher-krebeck.de/projekte.php

Photo 1

Photo 1: Significant reduction in floating layer, more homogeneous and therefore less stirring effort required compared to photo 2 from preceding year with pronounced floating layer

Photo 2

Biogas plant: experiment with digestate

Beginning of experiment: 16.02.2013 - 2 containers are filled with 120 l digestate each.
In one container, 50 ml of plocher digestate activator me is added and stirred in.

PLOCHER sample:
aerobic, pleasant odour, uniform, homogeneous, liquid substance.
Optimum fertiliser for soil life.
Aerobically treated digestate supports soil life and humus formation!

27.04.2013

Control:
anaerobic, unpleasant odour, viscous substance
Anaerobic digestate inhibits the development of soil biology and leads to problems in plant cultivation.

The effects of using anaerobic digestate as fertiliser in a field-based comparison:

Visit to the farm of Thomas Leins on 22 July 2016
Since 2013 ecological management of the arable farm, ploughless for the last 30 years.

Question: Why did you make this fundamental shift in your business?
"The soil has shown me the way!" was Thomas Leins' spontaneous reply.

Now in the third year, and the soil has developed considerably due to the PLOCHER products. Shortly before the trip to the field, 30 litres of rain fell within 20 minutes. This made the success particularly visible: **a stable crumb structure!**

Soil valuation: 45 soil points

The smell test and the soil probe test underline the result!

Soil valuation: 75 soil points

For comparison a recently acquired area of rented land:
The aftermath of the rain shows clearly the lack of biological tillage (fertilisation with digestate by the previous tenant farmer).
Despite a high soil valuation, the soil forms puddles and is unable to absorb the rain.
June 2016: Sowing of soy and
first application of plocher humus soil me
and plocher leaf-special me.

Field reports by Aleks Gamza
a.gamza@plocher.de

Aerobic treatment of separated digestate

The weakness of most biogas plants is the increasing proportion of dry substance which accumulates over the course of time.

If there is too much dry substance in the fermenter, the bacteria can no longer work properly, the material becomes difficult to convert and the methane yield decreases. This problem spreads across the entire process and has a negative effect on the entire plant.

The greatest danger is the formation of enormous floating and sinking layers from material with unmetabolised cellulose, which reduce the efficiency of the entire biogas plant.

In order to counteract this problematic issue, a productive increase of the biology in the fermenter is essential.

The following PLOCHER products are ideal for this purpose:
- plocher liquid humus me or cc for facilities using slurry
  (installed at source in the animal housing)
- plocher digestate activator me for aerobic processing of digestate slurry
  (for all types of facilities)

Many biogas operators try to separate the dry substance from the digestate slurry, in order to return the liquid part to the system. This is done as a means to reduce a further increase of the dry substance in the fermenter.

This measure requires a considerable workload and financial input. Furthermore the anaerobic fermentation substrate impairs the formation of humus and therefore the development of soil fertility.

Humus formation instead of humus reduction!

Decisive for commercial success is that the fermentation residue in the repository is aerobically processed with plocher digestate activator me (recommended dosage: 1.5 – 2 l/100 m^3) and can thus be spread in line with demand and in a plant-accessible state.

Test 2018:
Properties such as visual appearance, odour and visual transformation processes, as well as effects after spreading on the field were to be compared.
03.07.2018: 200 kilograms each of separated digestate were prepared:
control and PLOCHER (treated with plocher digestate activator me)
After a period of four weeks, the following differences could be observed on the compost heap:

Control:
mould formation, light colour, hardly active, putrefying smell

PLOCHER:
optimum decomposition process, evident activity, pleasant odour, good structure and dark colour, many mycorrhiza and fungal spores visible

Conclusion:
The use of PLOCHER products in the area of biogas generation is commercially viable right from the outset:

- In the fermenter it is possible to achieve an increase in methane yield.
- In the repository, the anaerobic digestate is activated aerobically. This leads to humus formation and thus to sustainable soil improvement.

With our PLOCHER products, we support a sustainable circular economy, relieve the water and protect the groundwater.

Field report by PLOCHER distribution partner Rupert Paulus,
Otterzhofen 2, 93339 Riedenburg, 0175 1853112, rupert.paulus@t-online.de

Aerobic processing of separated fermentation substrate

Project progression:

To set up the experiment, two samples were taken from digestate slurry already treated with a competitor's product.

The first sample was treated with plocher digestate activator me (recommendation for use: 1.5 - 2 litres/100 m^3), the control sample was not treated with any further products. After three weeks, a significant difference could be recognised in the containers.

The digestate slurry treated with plocher digestate activator me smelled considerably more pleasant and was visibly more biologically active. Furthermore, this digestate slurry was more homogeneous and formed more small bubbles In comparison with the control sample, the colour was much richer and darker.

Regarding the control sample in contrast, after three weeks the plant operator and Rupert Paulus noticed that the intensity of the odour was quite overpowering and much stronger. In addition to the intense bad smell, the unconverted cellulose parts indicated less biological activity.

Conclusion:
These positive test results prompted the biogas plant operator to use PLOCHER products on a broad scale at his farm, not only for the biogas plant but also for production of organically cultivated products in arable farming.

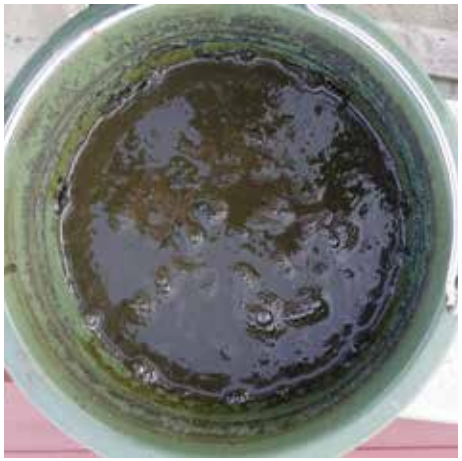
With PLOCHER:

Digestate slurry treated with plocher digestate activator me after three weeks

After short stirring:
The sample is homogeneous with increased formation of fine bubbles, odour-neutral and of "creamy" consistency - aerobic active biology.

Control:

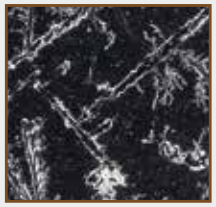
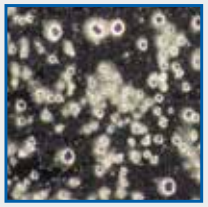
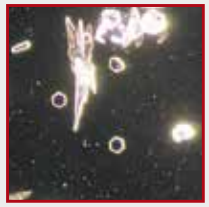
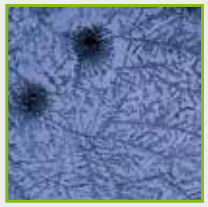
Control sample:
(Use of a competitor's product)
after three weeks



After a short stir
The sample had a very unpleasant odour and the non-decomposed structures were still clearly visible. In terms of colour, this digestate slurry was inhomogeneous, blotchy and rather light-coloured.

Field report by PLOCHER distribution partner Rupert Paulus,
Otterzhofen 2, 93339 Riedenburg, 0175 1853112, rupert.paulus@t-online.de

Crystal analyses

	Slurry	Water	Grapes	Apple
				
Control				
with PLOCHER				

Source: WasserStudio Bodensee, Dr. med. vet. Wilhelm Höfer, Überlingen 08.04.2019
200x enlargement

Vital processes in a natural environment

Vital processes in a natural environment are identical, as crystal analyses show:

Spagyric crystalline images represent a reliable visualisation of the quality of the vital energy. It is possible to reproduce these pictures at any time, and they clearly convey the differences between disorder and order:

Disorder

Control:

- generally undifferentiated small crystals, lack of structure, no formation
- right-angled and parallel structures indicate a hardened situation, i.e. a low level of fermentation and organic nitrogen bonding

Order

with PLOCHER:

- fine-structured and naturalistic crystals, oscillated on a broad axis, uniform specimens which are well-known as a symbol of vitalising energy.
- large, rough crystals are surrounded by fine, moss-like crystals

40 YEARS 1980-2020 PLOCHER®

Nature-friendly circular economy with the PLOCHER health concept

THE OTHER AGRO-TECHNIQUE means:

- **treating the causes rather than tackling the symptoms**
- **less effort - better quality - more success**

PLOCHER AGROTECHNIK ANDERS.

FSC MIX Papier FSC® C006517

1. Humus formation and field hygiene:
Aerobic treatment of the farm's own resources into valuable farm manure with PLOCHER slurry, PLOCHER fermentation residue and PLOCHER compost additives. Soil revitalisation and surface composting, ground treatment of animal outlets with plocher humus soil.

Conclusion:
Revitalised soils, improved nutrient utilisation, regulation of pH-value and of air and water balance. Field hygiene by means of decomposition: Infection potential due to pests from the soil is reduced significantly because promotion of composting = protection of soil & crops = protection of ground water & water = emission control = climate protection

2. Crop cultivation:
Sustainable, kind-to-the-soil cultivation for vital plants with PLOCHER plant products.

Conclusion:
Stronger root growth, improved nutrient uptake, biologically high-quality.

3. Livestock farming:
PLOCHER Supplements, PLOCHER Water vitalisation and PLOCHER Harmonization

Conclusion:
Healthy and lively animals.

4. Cleaning of animal housing – climate of animal housing:
Cleaning of animal housing with plocher all-purpose cleaner as well as slurry and manure treatment with PLOCHER slurry additives and PLOCHER compost additives.

5. Profitability:
The laws of nature apply for all forms of farming practices, which is why sustainable management is the prerequisite for successful economic performance!

Conclusion:
PLOCHER products are economical as well as ecological. A reliable way to achieve business success - and contribute to environmental protection.

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09.2020mjdh Translation: Carol Hogg Fachübersetzungen