

# **Application of Ressources on Wheat- Straw and their Impact on Humus**

# Thesis 1:

**“Formation of humus in soils depends on:**

**a.) carbohydrates and their digestion...**

**b.) ...*and the occurrence of an balance of amino acids OR microbes/enzymes that are able to produce them!***

**( Florian Hille, 2014)**

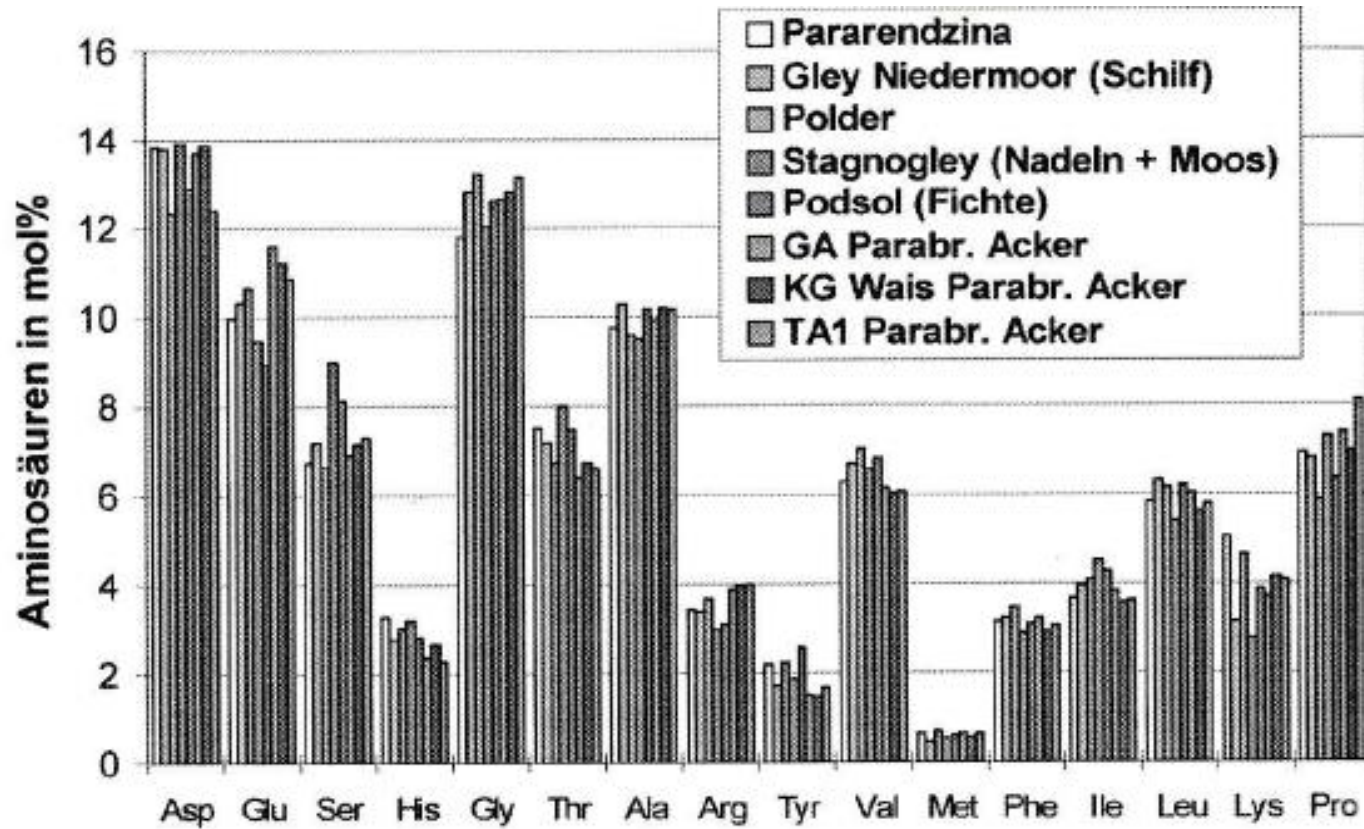
## Thesis 2:

*“The most restricting amino acid in formation of humus limits the potential of Carbon-Sequestration, the less stable protein out of an substratum is build, the more Carbon is volatized into atmosphere”*

( Florian Hille, 2014)

...as 90% of in soil occurring nitrogen is  
humus-bound nitrogen as amino acids /  
aminosugars.

...as German Scientist Edwin Scheller  
discovered same balance of amino acids in  
every soil.



( Scheller 2013)

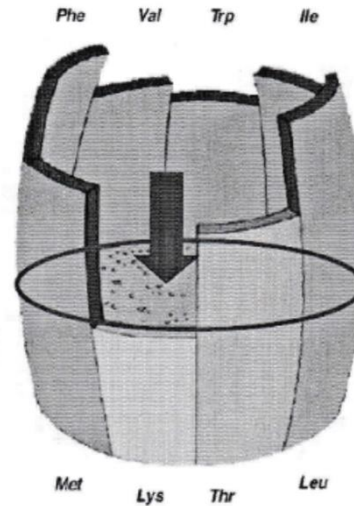
...comparable to:

→ Anwendung  
des Gesetzes  
vom Minimum

= direkte Beziehung  
zum Gehalt an  
LAA im Futter

Beispiel:

Getreide



Law of the minimum in reference to  
limitation of monogastric (pigs) by  
amino acids.



kg Carbon / t Dry Matter	480	500
kg Carbon Humus / t Dry Matter	75	115
<b>% Carbon into Humus</b>	<b>15,6 %</b>	<b>23 %</b>



**Cattle Manure delivers the same amount of carbon per t of dry Matter as straw.**



***It's not the Carbon which is building the humus, it's the amino molecules which are gluing the carbon to the life and minerals of the soil!***



**problem: to many farms without  
animals / diverse rotation**

**→ Onesided feeding of soil life leads  
to less and less carbon „glued“ to life  
and therefor the soil.**

## **Research:**

**Application of different resources for giving the soil the possibility to produce these amino acids.**

## August 2013: 8to wheat-straw dry matter /ha

- 1.) Treatment: 0-Application
- 2.) Treatment: 83,33l **UAN** / ha
- 3.) Treatment: 41,5l **UAN** / ha  
25l **ATS** / ha  
15l **Molasses** / ha
- 4.) Treatment "Böhm": 1l **Gaiasan** / ha  
2l **Humisol** / ha  
100g **Lignohumax AM** / ha  
15l **Molasses** / ha

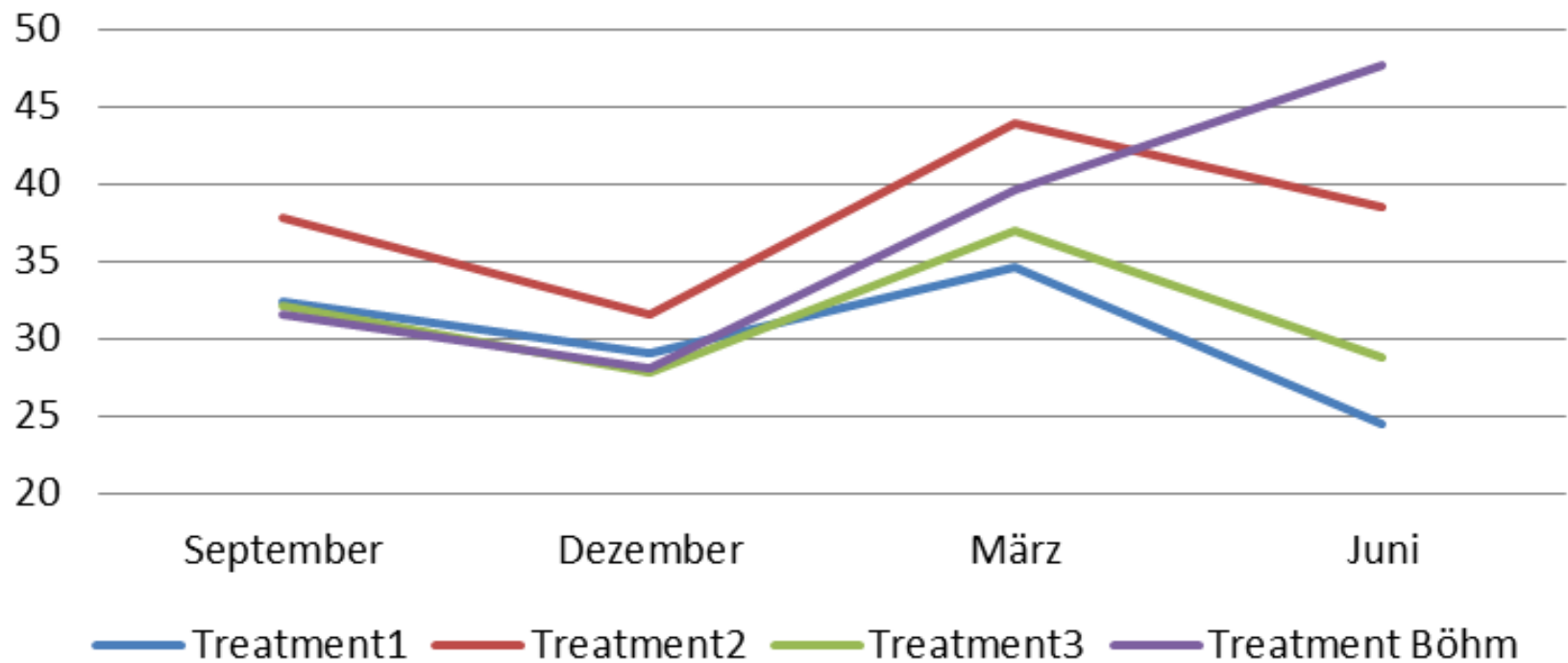
**Research was in conducted by student of  
Bachelor (Agribusiness) and therefor:**

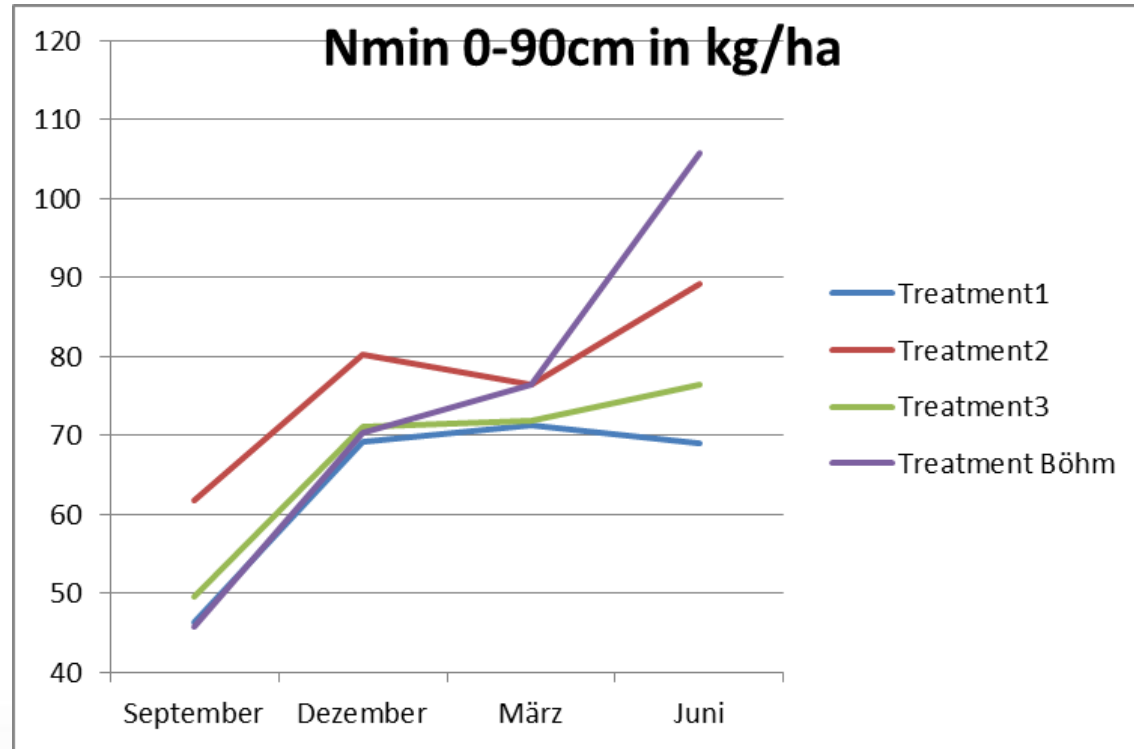
- **greatly restricted ressources in therms of  
available methods for chemical and biological  
investigastion/analysis**



**Randomized Plots with 4-fold replication,  
application of treatment in August 2013 in front of  
tillage, 2014 Maize.**

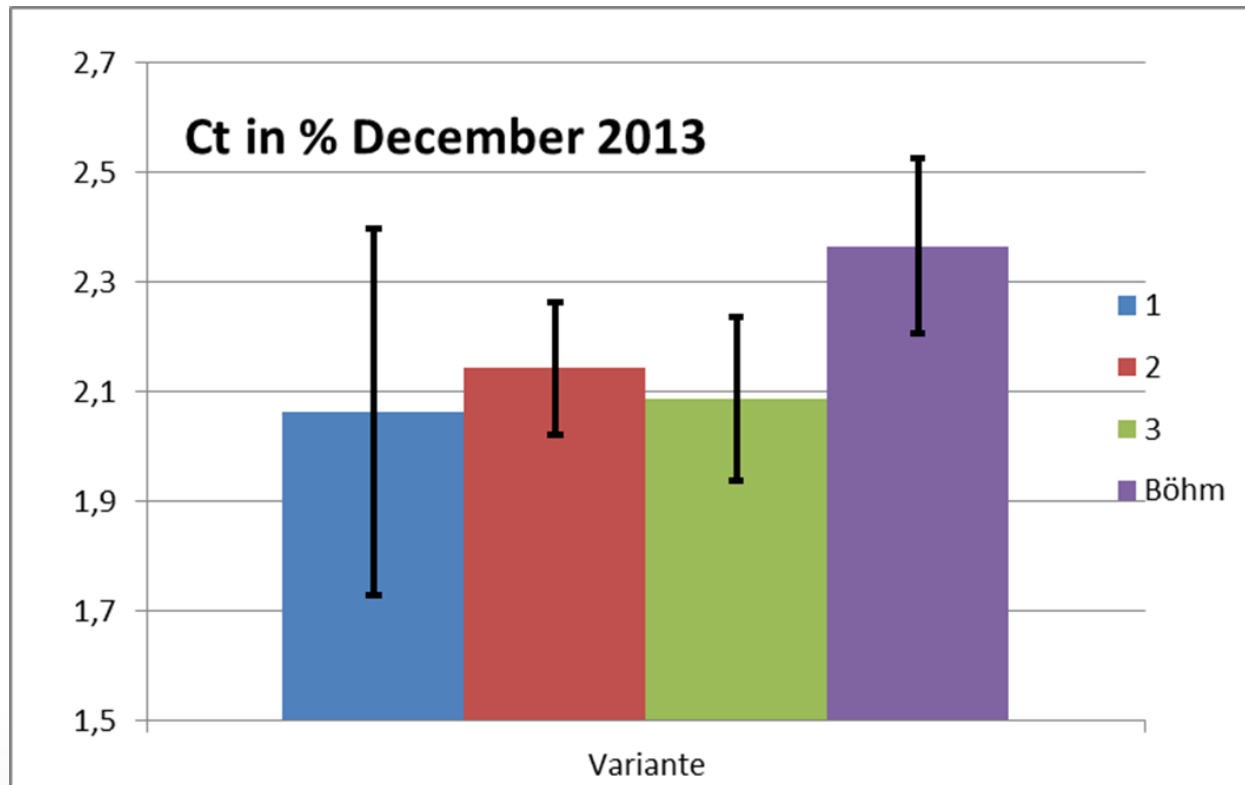
## Nmin 0-30cm in kg/ha



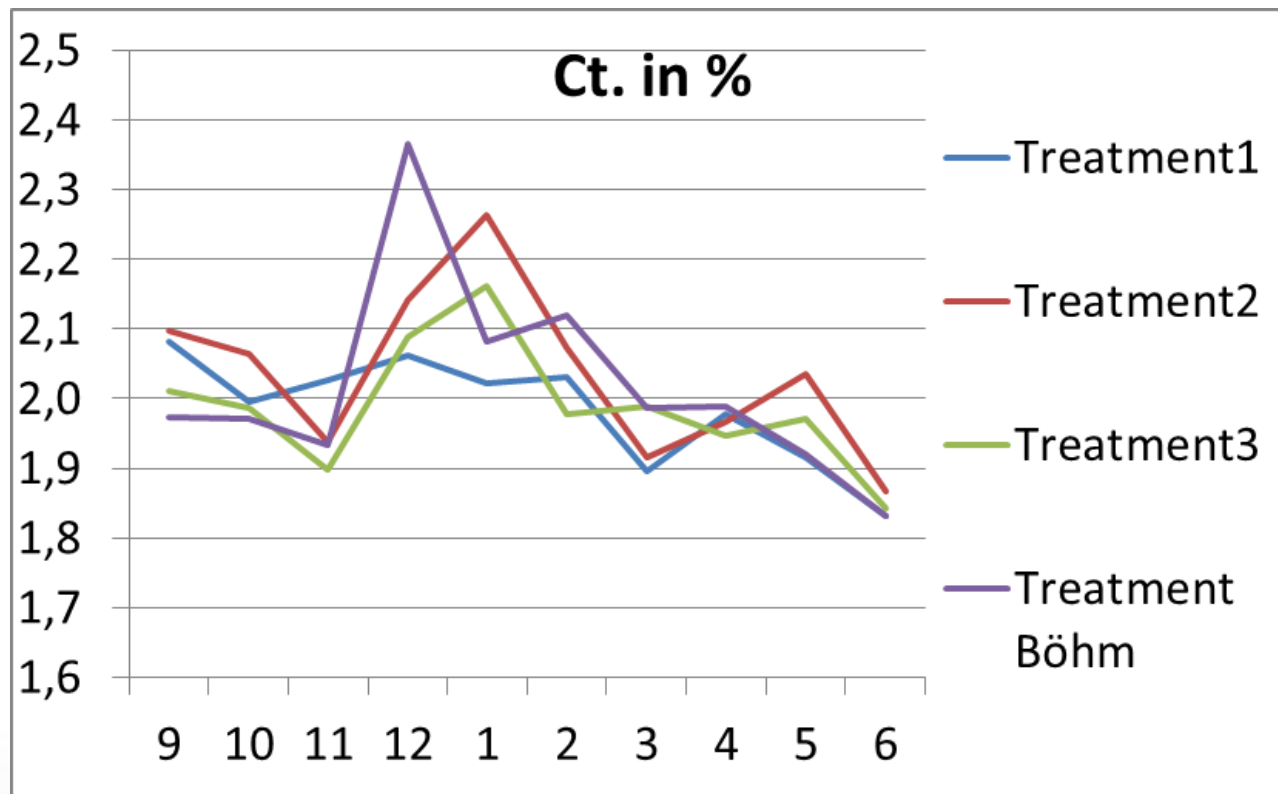


**With Treatment „Böhm“ 105,7kg /ha Nmin in comparison to no application Treatment „1“ with 69kg N / ha in Juni of 2014 under Maize !**





From September until Dezember Treatment „1“ showed decrease of carbon by – 443kg C/ha, Treatment „Böhm“ did lead to increase of + 8820kg C/ha!



**With Treatment „Böhm“ high accumulation of carbon in autumn/ winter with following mobilisation in spring/summer for better crop performance!**

## **Results:**

Treatment „Böhm“ with biostimulants showed stronger influences on nitrogen / carbon turnover in comparison to chemical applications. nitrogen/ carbon showed stronger accumulation in winter time and faster release in spring for reduced risk of environmental impacts and better crop output.

More Research with better adapted methods is suggested for better understanding of the involved dynamics.

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