Ÿnsect unveils the results of its insect-based fertilizer - ŸnFrass

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Ÿnsect is an innovative company that specializes in breeding insects and transforming them into high quality ingredients for pet, livestock and plant feed and health. After its blockbuster product - the ŸnMeal™ protein - and its unparalleled performance in terms of nutritional and health gains for animals, Ÿnsect unveils the very promising results of its organic fertilizer ŸnFrass™ from Molitor: Ÿnsect thus enriches its offer with a new flagship product with a very high added value for the fertilizer market.

Since the implementation of its Ÿnsite demonstration unit at the end of 2016, Ÿnsect is seeking to promote the by-products of Molitor protein production, in particular the frass (insect excrement). It rapidly became clear that this product could offer very interesting plant nutrition properties. The product - trade name ŸnFrass™ - is a chemical-free, organic fertilizer with an NPK (Nitrogen, Phosphorus, Potassium) content of 4 - 3 - 3 and an organic matter content of around 90%. In accordance with regulations, ŸnFrass is hygienized and comes in the form of granules or powder depending on the intended applications.

In partnership with the agricultural engineering school UniLaSalle, Ÿnsect was able to carry out life-size tests on wheat, rapeseed and corn in order to evaluate the fertilizing power and soil impact of this natural fertilizer.

For the same (NPK) nutrient content, the objective of field trials was to compare 5 conditions for each crop: 1) No input, 2) 100% mineral fertilizer, 3) 50% mineral fertilizer and 50% ŸnFrass, 4) 30% mineral fertilizer and 70% ŸnFrass and finally 5) 100% ŸnFrass input.

The tests showed a biomass and yield increase, which was in some cases significant, on all tested crops compared to that of a 100% mineral fertilizer:

Rapeseed:

- **300% increase in biomass before winter (due to nitrogen availability).**
- **At the 'early flowering' stage, biomass increase of 75% with a visible dose effect.**
- **In terms of yield, there is an increase of 20%**

Wheat:

- **25% increase in the number of shoots.**
- **40% increase in biomass.**

Corn:

- **70% increase in biomass at the 8-leaf stage.**

In addition, apart from providing essential nutrition for crops, ŸnFrass appears to improve the biological properties of soil. Measured under greenhouse conditions, microbial activity showed a strong increase where ŸnFrass was present (+ **180% in loam-clay soil and + 250% in luvisol**) compared to 100% mineral fertilizer. ŸnFrass could thus improve the mineralization of organic matter in soil and, therefore, the formation of the clay-humic complex.
Finally, a significant advantage for local residents; compared to the use of liquid manure, ŸnFrass is odorless.

The promotion of ŸnFrass products by Ÿnsect is part of its commitment to 'zero waste', capitalizing on all components of these insects, and to the circular economy: Ÿnsect aims to become a local partner for farmers by offering high-performance fertilizers that square the nutrient circle; whether in the Jura department, with Ÿnsite, or in the Somme department with the first Ÿnfarm unit that is currently in the pipeline.

"Our results showed that ŸnFrass *is a particularly promising product in the organic fertilizer market. We strongly encourage Ynsect to continue along this line of development*" **Dr. David Houben, UniLaSalle Soil Science Teacher-Researcher**

"This ŸnFrass study underscores our desire to become part of the stakeholders' territory.

Firstly, with research centers like UniLasalle, to identify and promote our product's qualities.

But also with farmers, to capitalize on their by-products in SFSCs[1] to feed our insects; as well as the return of nutrients to soil, via the use of ŸnFrass – a very high-performance fertilizer with unparalleled performance today – on local crops to enable local farmers to produce more with less, whilst protecting soil and the environment.

As a pedologist (soil scientist), I am very happy that we have already started to contribute to this circular economy in the Hauts-de-France with Ÿnfarm#1. " **Antoine Hubert, Ÿnsect's CEO**

ŸnFrass products are universal (professionals and the general public) and intended for all types of crops: vegetable crops and market gardening, arboriculture/viticulture, meadows, turf & open spaces, field crops and especially corn, rapeseed and barley. The Molitors are fed exclusively on raw materials authorized by French and European regulations for farm animal feeds. ŸnFrass is made of 100% frass, with no chemical input. This makes it a fertilizer that is compatible with organic farming, and not subject to any specific restrictions (EC N° 889/2008 Regulation on organic production [Appendix 1]).

Several of the main stakeholders in the agricultural field are already onboard with this innovative product. Pre-sales are expected to accelerate in 2019 with the construction of the Ÿnfarm#1 vertical farm in Amiens (France).

About Ÿnsect

Ÿnsect is a French company that specializes in the large–scale breeding and processing of insects for animal and plant feed. Set up in 2011 by 4 co-founders, Ÿnsect aims to make insects essential resources for farm, pet and plant feeds. As protein demand continues to grow, the company's goal is to create a more natural and sustainable animal feed system. Ÿnsect has designed and developed an exclusive technology for the obtention of high quality protein, oil and fertilizer from Mealworms: vertical farms called "Farmhill®".

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[1] Short Food Supply Chains