



C.L.F. MODIL®

- > A system which revolutionizes and enhances the use of wastewater, using natural systems of transformation in organic substance
- > The C.L.F. Modil® plant is a modern, revolutionary and cheap biological method of purification of slurry and wastewater
- > The plant of biodigestion C.L.F. Modil® transforms wastewaters in a mixed fertilizer Amending Compost (D.lgs. 217/06) of high quality for agricultural crops
- > The C.L.F. Modil® system works respecting the objectives of Kyoto pact, producing excellent organic substance.

Aerobic biodigestion is a transformation process:

- **Biologic** > turned up by microorganisms
- **Aerobic** > takes place in presence of oxygen
- **Termophilic** > develops heat

The developed heat allows to reach temperatures ables to:

- **Accelerate the transformation process,**
- **Evaporate big quantities of water,**
- **Igienize the material from unwanted microbes, animals or vegetables.**

SECTORS



BIOGAS
BIOMETHANE
DIGESTATE



ZOO
TECHNICAL
WASTE



AGRI FOOD
WASTE



ORGANIC
SUBSTANCE

RESULTS

- Reduction of wastewater quantity:
(From 1/7 to 1/10) of the initial volume
- Reduction of nitrates: (over 65%)
- Reduction of ground needs;
- Organic substance production.

C.L.F. MODIL® IN THE WORLD

Biomodil boasts over 40 still working plants which has been delivered since 2004.

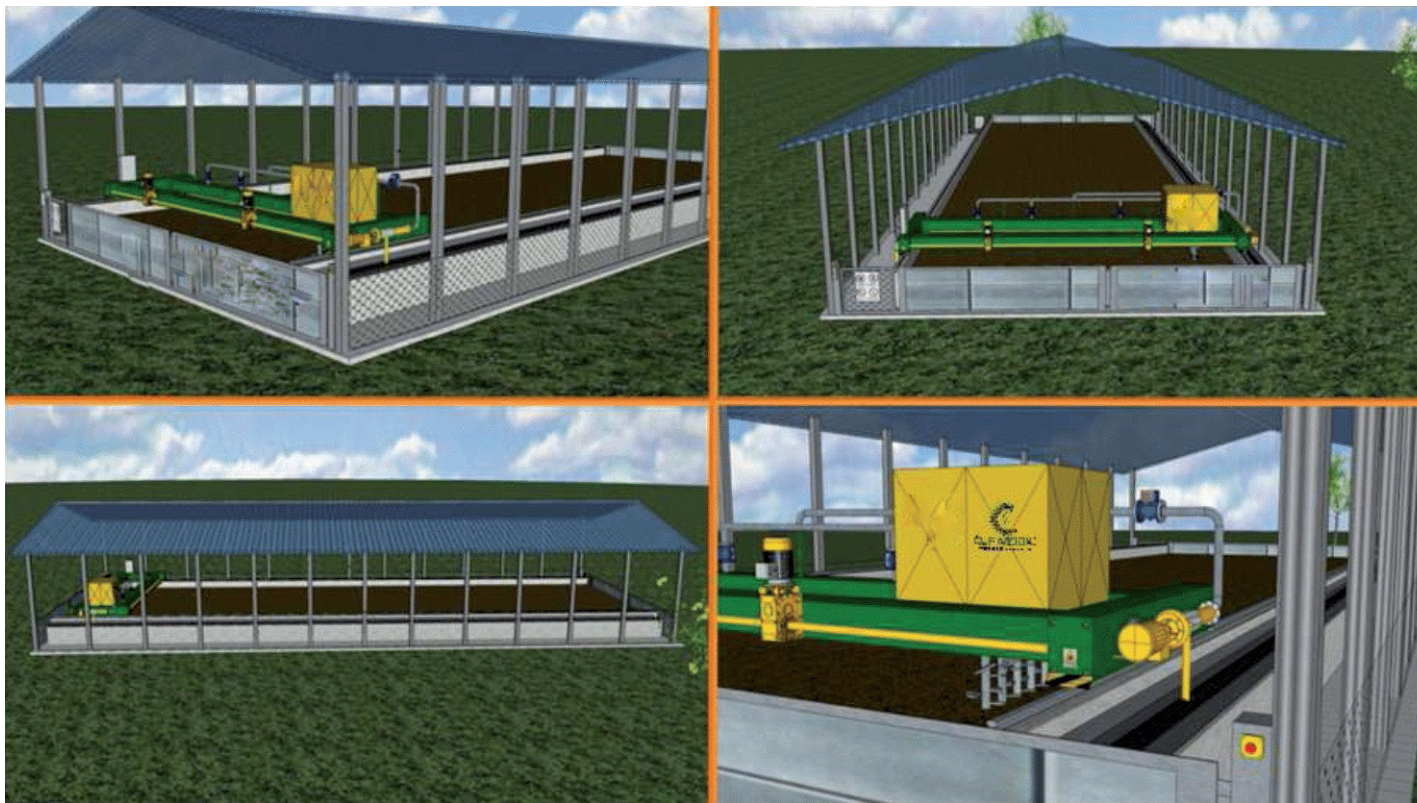


2010

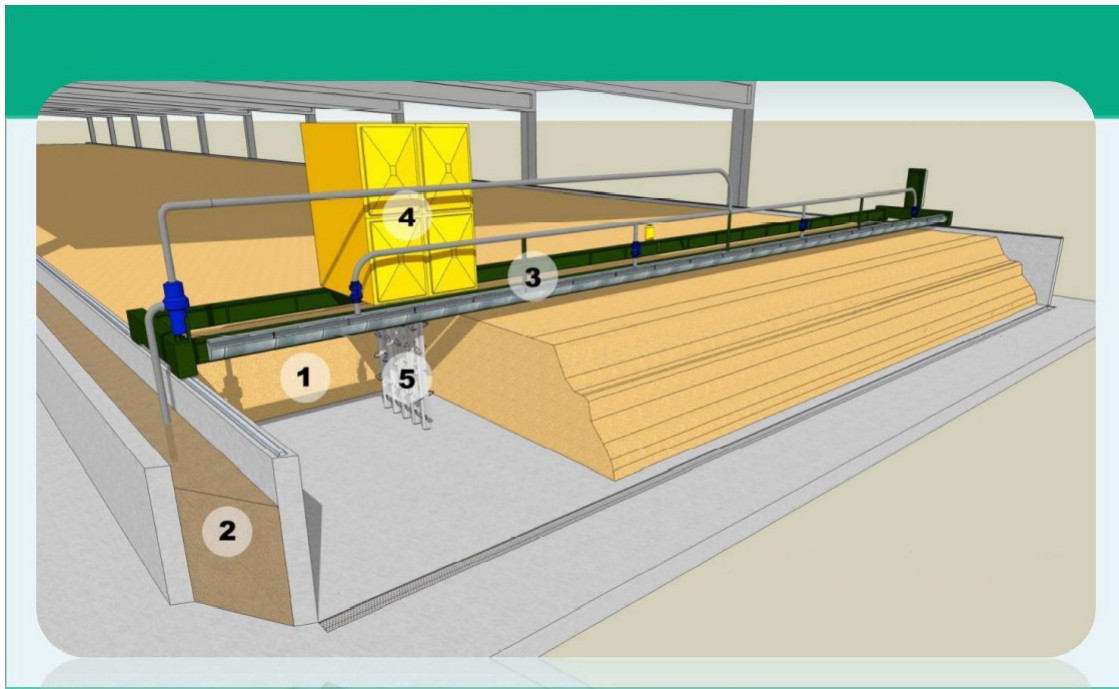


2022

RENDERING COMPLETE PLANT



C.L.F. MODIL[®] SYSTEM



CLF MODIL PLANT SYSTEM SCHEME

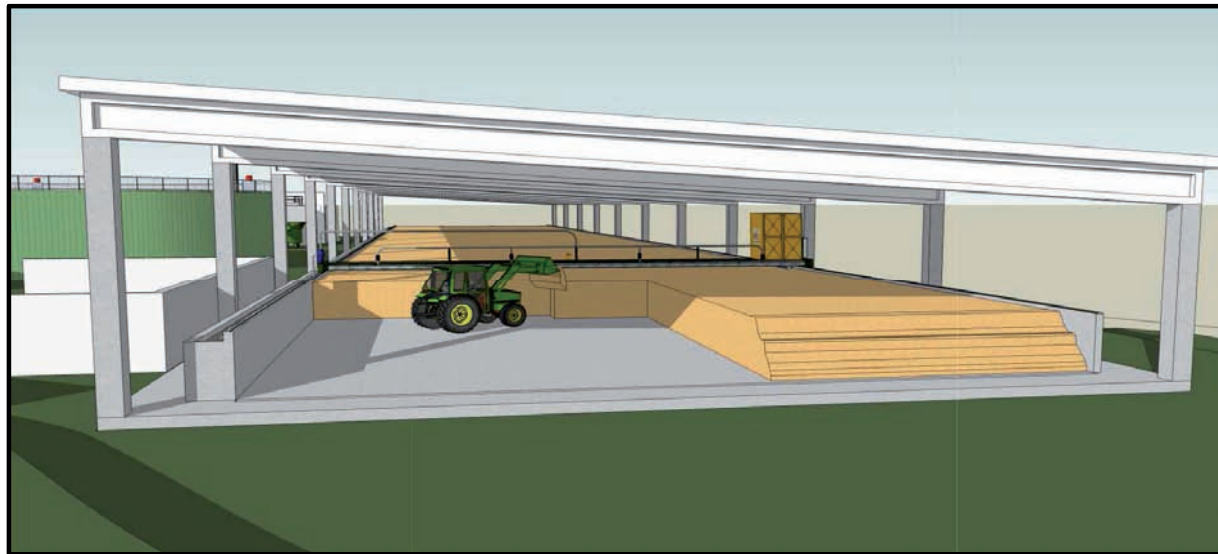
- 1 - Reactor
- 2 - Alimentation tunnel
- 3 - Overhead crane for
wastewater charge and tilting
- 4 - Tilting unity
- 5 - Gauges for aeration and tilting

WORKING STAGES

To begin the working stage of CLF MODIL® is necessary to prepare the substrate in the tank. Below the phases:

STAGE 1

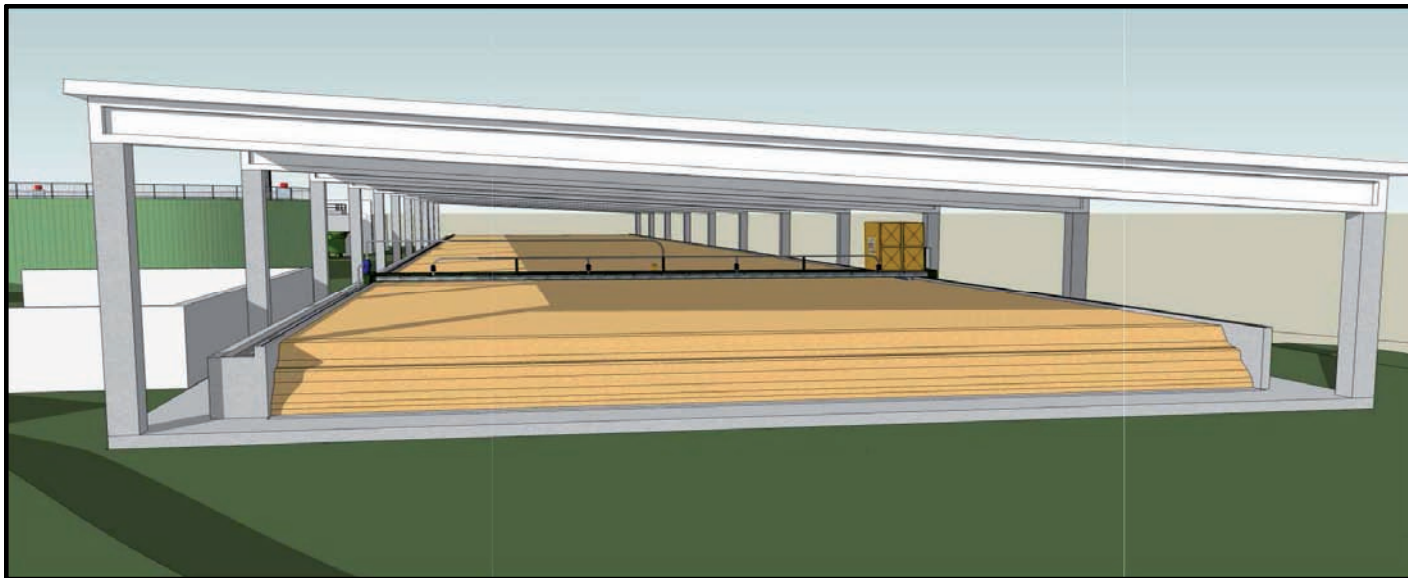
In the first stage the tank is filled with dry vegetable material, for example straw, fungal straw, ground pruning, corn stockings, rise chaff etc.



WORKING STAGES

STAGE 2

When the tank is full, the plant CLF MODIL® is ready to begin the working cycle. The implant is equipped with a pump that aspires the wastewater from the alimentation tunnel to the intern system that sprays all the bed of lignocellulose material, prepared before in the tank. The wagon goes on longitudinally alternating the stage of moving with the stage of the castle. The castle in the working stage moves horizontally compared to the tank with contemporary the stage of spreading and working.



WORKING STAGES

STAGE 2

Spreading and contemporary processing.



WORKING STAGES

STAGE 2

Plant working phase in the return stage to the bottom of the tank.



WORKING STAGES

STAGE 3

At the end of the process (it can last until 120 days), the material is ready. Starting from ten days before the cycle ending the plant doesn't do spreading's but it only does work cycles to homogenize the amending.



The process can last from 60 to 120 days The daily absorption of wastewater goes from 12 to 18 L/day x M3

WORKING STAGES

STAGE 4

When the tank is empty it should be filled with new vegetable material and a new stage begins.

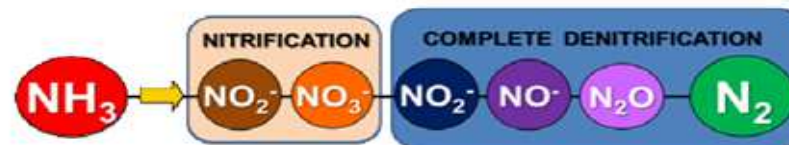


REFERENCE

Particular attention was put on this problematique during the screens, in order to verify enviromental sustainability of the process. The results show:

- Mass reduction due to water evaporation;
- Nitrogen reduction with low emission of NH_3 and N_2O ;
- Greenhouse gasses's emission reduction;
- Smell reduction

The loss of nitrogen with very low emissions of NH_3 and N_2O happens thanks to the emission of N_2 , as result of Nitrification-Denitrification. This biological process is using in the depuration and happens normally in the ground.



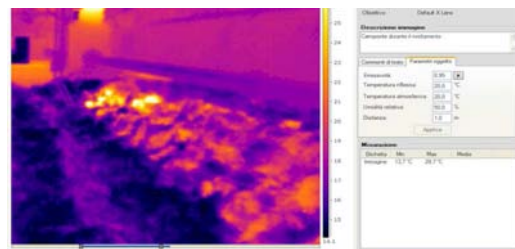
The process includes the transformation of ammonia in nitrate and nitrated (nitrification). Then, denitrifying bacteria act on them (denitrification) producing N_2 , the major component of our atmosphere.

The process has not an enviromental impact, on the contrary it prevents the emission of NH_3 which is in big quantity with slurry and wastewater

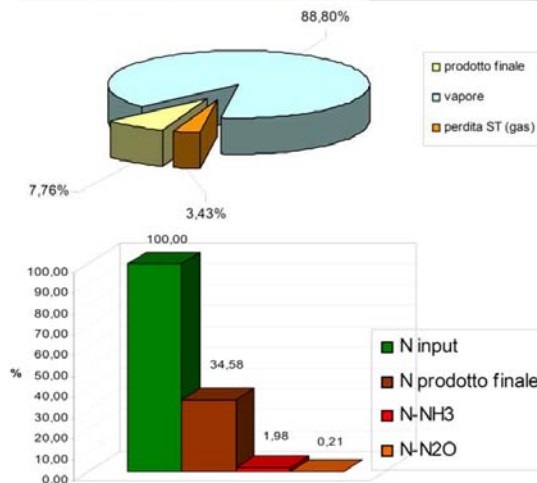
Prof Roberto Chiumenti rural building and country Udine University



EXPERIMENTS



The temperature turned up to be very variable with values until 60°C and decreasing in the end of the cycle.



Reduction of mass: 80-90%

Reduction of nitrogen :
60-70%

Prof Roberto Chiumenti costruz. rurali e territorio Università di Udine



RESTRUCTURING EFFECTS

RESTRUCTURING EFFECTS USING LIKE FERTILIZER, THE FINENT IS GUARANTED TO THE GROUND A GRADUAL RELEASE OF NUTRIENTS, IN PARTICULAR OF NITROGEN.

IN FACTS IS A WELL-KNOWN DATE, THAT COMPARED TO THE TOTAL OF NITROGEN PRESENT IN THE FINENT, THE 10-15% IS MINERAL NITROGEN IMMEDIATELY AVAIBLE, THE 10-20% IS NITROGEN THAT BECOME MINERALIZED DURING THE FIRST YEAR OF AGRICULTURE AND THE 65- 85% IS NITROGEN OF RESERVE THAT REMAINS IN THE LAND.

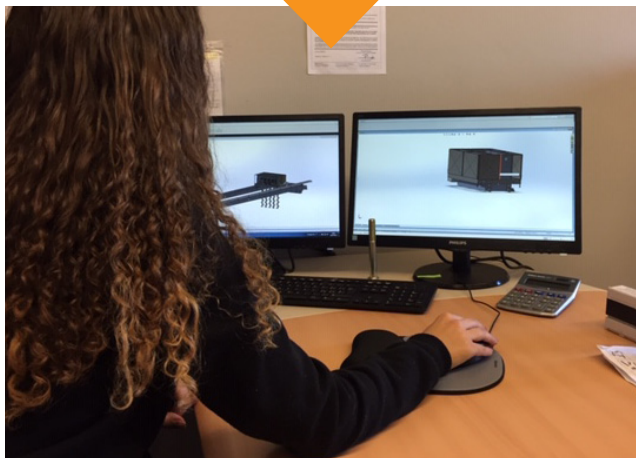
Prof Ermes Frazzi Agricultural Engineering Piacenza University

HUMUS FUNCTION IN LANDS



BIOMODIL SRL WITH HIS STAFF

CAN MAKE AVAILBLE INTERESTED BUYERS FOR THE WITHDRAWAL
OF THE FINENT MADE BY CLF MODIL® IMPLANT



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