

Poultry litter gasification ash as a cost effective cropping fertiliser

Background

Gasification technology can be used to process poultry litter into energy. The end product of this process is ash that has high quantities of phosphorous, potassium and other useful cropping nutrients.

The technology was developed and is used in the United States and Australian farmers have travelled overseas to investigate the technology for potential adoption in Australia.

This project was developed to test the value of the ash as a fertiliser, compared to conventional DAP (18:20), to determine the market interest in the fertiliser ash, and the subsequent cost benefit for a poultry farmer looking to adopt gasification technology.

The method

The gasification technology does not currently exist in Australia. Therefore, the poultry litter ash was sourced from Enginuity Energy LLC, a gasification company from Pennsylvania, USA, and made from an EcoRemedy gasification process.

Feeco, a specialist granulation company, granulated the poultry litter ash at their Victorian Laboratory.

Two samples were granulated. One was plain poultry litter gasification ash, and the other was poultry litter gasification ash at 80% blended with Cool Terra biochar at 20%.

In 2015 the granulated products were sown in a replicated trial at the Mallee Sustainable Farming field site, at Lowaldie.

A barley crop was sown on the 27th May 2015.

Treatments compared the following products and rates:

- DAP (18:20) at 50 and 100kg/ha.
- Poultry litter pellet at 50, 100 and 200kg/ha mixed with urea at either 15 or 30kg/ha.
- Poultry litter pellet and Biochar at 50, 100 and 200kg/ha mixed with urea at either 15 or 30kg/ha.



Above – (L) 100% ash and (R) 80% ash + 20% Biochar. The poultry litter ash was granulated into a flowable and low dust product suitable for application with cropping equipment.

The results

The site at Karoonda experienced dry conditions throughout the season and the barley crop struggled to establish well. The season finished poorly and due to crop failure the replicated field trial was not successful.

However, the project has demonstrated the poultry litter gasification ash once granulated, is satisfactory for farmers to use through common cropping equipment.

The Mallee Sustainable Farming field day at Lowaldie attracted 110 farmers and the concept was presented on the day with much grower interest.



Right – SANTFA Technical Officer, Andrew Bird explaining the process and product to cropping farmers at the Mallee Sustainable Farming Field

Recommendations

There is still a knowledge gap in terms of assessing the value of poultry litter gasification ash as an alternative fertiliser in Australian cropping systems. The trial will need to be repeated and benefits will need to be clear before any investment is likely to be made in producing the product commercially in Australia.



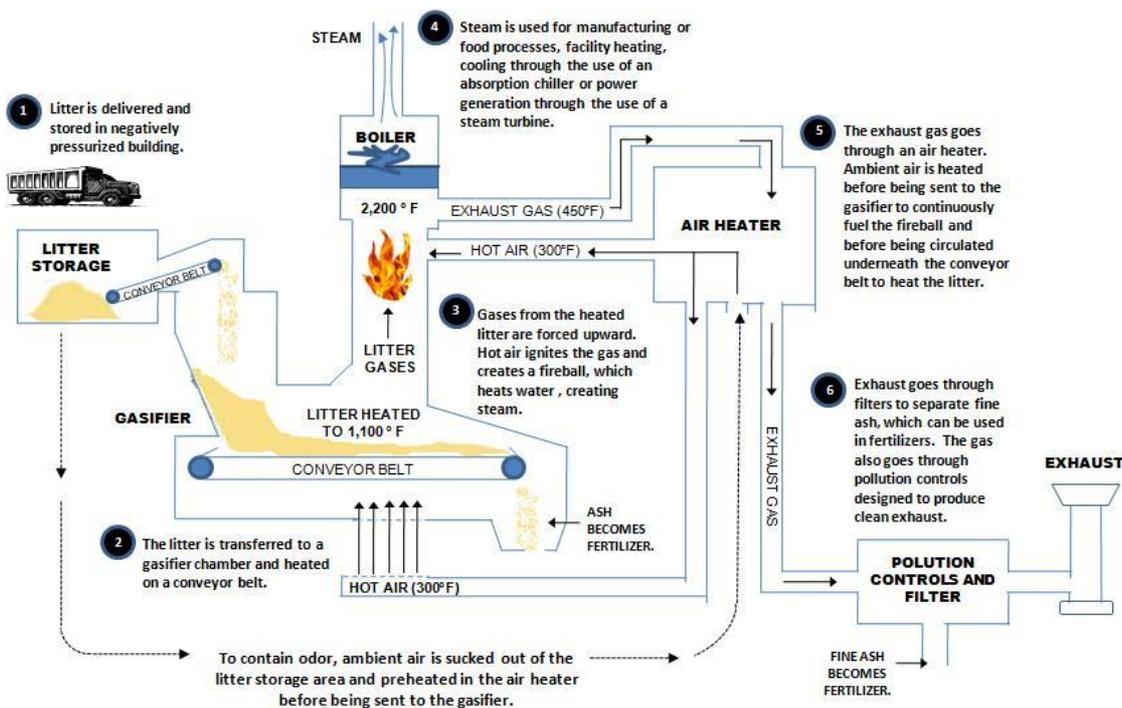


Diagram (Source Ecoremedy® <http://ecoremedyenergy.com>) - Conceptual diagram of the poultry litter gasification ash process.

Conclusion

Intensive poultry production is a growing industry in the regions. If poultry litter gasification ash is proven to be a cost effective cropping fertiliser, the adoption of the technology could be widespread.

Cropping farmers are likely to benefit from lower freight costs and more targeted application of nutrients associated with sourcing poultry litter.

Poultry farmers are likely to have an opportunity to better manage poultry litter so that emissions are reduced, renewable energy is generated and their businesses benefit from value adding.

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