



The remains of the day

by Gerrit Bezuidenhout

Summertime brings with it sunshine, warmth and plenty of socialising. As a result, the consumption of fruit and fruit juice increases this time of year. Nevertheless, few people actually wonder what happens to the waste – the peels, the pulp, and all the other bits and pieces left behind once fruit processors have finished making their products.

Just feed it

Because of its high acidity, citrus waste in particular presents a problem; therefore, various methods have been invented to manage this properly. Past management practices included using the waste as compost on cultivated land, or dumping it on wasteland. Liquid waste was put in ponds or was merely disposed into sewers or streams. This presented a huge problem to the environment, since the biochemical oxygen demand (the oxygen needed to break down the waste) grew to such an extent that aquatic life was killed off. Sewage-treatment plant capacity was also exceeded, and the runoff ended up in rivers and dams. As a result, widespread research was done to find ways in which to deal with citrus waste, leading to several new innovative processes being identified.

According to Kobie du Plessis from the South African Citrus Processors' Association (SACPA), the local use for citrus waste can be divided into feed, oils and compost.

"In the production of animal feed, either wet or dried peels can be used. The peels are firstly ground up in a hammer mill, before being pressed.

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After this, the pulp goes through a drying process in either a direct-fired, or steam-heated rotary kiln drier to remove moisture. The process has to be carefully monitored to ensure that the feed has the right consistency." Feed obtained from citrus waste contains about 8% moisture, 6% ash, 6% crude protein based on the total nitrogen, 6% crude fat, 14% crude fibre, and 66% nitrogen-free extract. The feed alone, however, is not enough to create holistic dietary animal feed, and supplements have to be added by feed manufacturers to complete the feed.

Kobie says though that the demand for citrus waste-based feed is growing strongly.

Another method in managing citrus waste is to make fertiliser from it. In the past, fruit waste was used as a soil conditioner on cultivated lands without any treatment, meaning that fertilisation was rather a convenient way to get rid of waste.

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Nowadays, Kobie says the use of citrus waste to create fertiliser is becoming more and more of a viable option to companies wanting to generate extra income from citrus waste. He says any citrus may be used in the manufacture of citrus waste fertiliser, but it is important to mill the waste to a very fine consistency. The pulp is then mixed with grass, chicken or cow manure and woodchips before a large quantity of water is added and left to ferment. The resultant compost can then be used in a wide range of agricultural practices.

The use of citrus waste to manufacture oils for cosmetic and industrial applications is yet another application that is well known. Kobie explains that the oils are extracted from the peels before leaving the factory.

There is, however, a limited market for South African citrus-based oils, since the widespread use of pesticides to ensure that the fruit is of export-quality, leaves residues that are sometimes higher than the cosmetic industry desires.



Citrus circle

“The manufacture of pectin from lemon peel especially, is a relatively new method of disposing of citrus waste,” Kobie explains.

Pectin is a thickener, used in fruit juices and in the confectionary industry where it is used as a replacement for animal-based gelatine.

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However, because of financial constraints, the process has not really taken hold in South Africa yet. Nevertheless, as Kobie points out, as pressure on the environment increases, factories will be more and more aware of the secondary uses fruit waste has to offer. **M&J**