Development of a mulch made from recycled paper

A **MACHINE** has been developed which processes waste paper into a mulch in the field. It is used as an attachment to a rice seedling planter. The six-row Japanese planter must be purchased, but the mulching machine can be made in a workshop. Much of the information we used to make this machine was provided by scientists in Japan.

The mulching attachment consists of a tank to hold the paper, several pairs of rollers which serve as paper guides, and a paper cutter. While the rice seedling planter works in the field, this attachment is mounted on the front of the planter, and discharges paper mulch simultaneously. Seedlings are therefore transplanted to the field, which is covered by the paper. An extra worker is needed if the paper mulching mechanism is being used.

Preliminary experimental results show that paper used as mulch helps to keep down weeds, reduces the quantity of herbicide and pesticide applied during rice culture, and slightly increases the rice yield. The mulching paper breaks down in the soil naturally, without causing any environmental problems.

News source: **National Chung Hsing University, Taiwan ROC**

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Rapid method of detecting adulteration of goats' milk

AN **INDIRECT** ELISA (enzyme-linked immunosorbent assay) and a sandwich ELISA were successfully developed in this study for the rapid, quantitative detection of cows' milk used to adulterate the more expensive goats' milk. Polyclonal antibodies were raised in goats against bovine caseins. The antibodies were recovered from crude antisera by ammonium sulfate precipitation, and partially purified by passing them through a DEAE anion exchange column. Both assays were able to quantitatively detect 0.0625 to 100% (v/v) cows' milk adulteration of goats' milk.

Indirect ELISA can be applied to raw milk, HTST milk, pasteurized milk and sterilized milk, while sandwich ELISA can be only applied to raw milk. The results of the indirect ELISA assays correlated very well with those of urea SDS-PAGE (polyacrylamide gel electrophoresis). However, indirect ELISA is more sensitive, and capable of providing a quantitative analysis.

News source: **Food Industry Research & Development Institute, Taiwan ROC**

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Degradable polyethylene films containing crosslinked potato starch

POTATO starches were crosslinked with 0.1, 0.5, 1.0, and 2.0% epichlorohydrin. Starch/polyethylene(PE) cast films were prepared to contain 5% of the crosslinked potato starch. The mechanical properties and degradability of these films were measured, and compared to those of films containing native potato starch.

The mechanical strength of the films containing crosslinked potato starch was higher than that of the film containing native starch. Thermal degradability, measured by a FT-IR and an Instron, showed that crosslinked starch/PE films degraded faster than native starch/PE films. Thus, the biodegradability of the starch/PE films was increased by the addition of crosslinked starch to the PE films.

News source: **Rural Development Administration (RDA), Suwon, Korea**

For further information, *Korean Journal of Food Science and Technology* 32,6: 1298-1305

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Changes in the composition of free fatty acids

In relation to ethylene production during the ripening of tomato fruits

ETHYLENE production and ACC oxidase activity were determined, and correlated to the composition of free fatty acids and ion leakage from normal "Rutgers" tomato with a non-ripening locus (nor) (*Lycopersicon esculentum*) fruit during their senescence. Ethylene production and ACC oxidase activity in "Rutgers" began to increase in the mature green stage, while the composition of free fatty acids changed and ion leakage increased in the breaker stage. In the case of the nor tomatoes, ethylene production and ACC oxidase activity began to increase 48 days after anthesis (DAA), which corresponded to the light red stage of "Rutgers".

The composition of free fatty acids started to change 50 DAA, and an increase in ion leakage was detected 53 DAA. It would seem that the changes in nor tomatoes associated with senescence occurred later, and were marked less than those of "Rutgers". Changes in the composition of free fatty acids and the increase in ion leakage followed an increase in ethylene production ACC oxidase activity in the senescence of "Rutgers" and nor tomato.

News source: **Rural Development Administration (RDA), Suwon, Korea**

For further information, *Korean Soc. Hort.* 39,4: 385-390

Overriding photoperiod sensitivity of flowering time by constitutive expression of a MADS box gene

MOST PLANTS sense changes in environmental signals, such as day length or temperature. A regulatory gene, OsMADS1, which controls the photoperiod sensitivity of flowering time, was identified. Constitutive expression of OsMADS1 in a long-day flowering plant, *Nicotiana sylvestris*, resulted in flowering under both short-day and long-day conditions. Similarly, ectopic expression of the gene in a short-day flowering plant, *Nicotiana tabacum* cv. Maryland Mammoth, also induced flowering, regardless of day length. Transition time depended on the level of the OsMADSI transcript in transgenic plants.

These suggest that OsMADS1 is a key regulatory factor that determines the transition from shoot apex to floral meristem, and that it may be used for controlling flowering time in a range of plant species.

News source: **Rural Development Administration (RDA), Suwon, Korea**

For further information, *Journal of Plant Biology* 43,1: 28-32.

Development of immunosorbent assay

For detection of *coxiella burnetii* antibodies in animals

BACTERIA *oxiella burnetii* is the causative agent of Q fever in animals and humans. This disease is found all over the world. In this study, we developed a competitive enzyme-linked immunosorbent assay (cELISA) and compared it with indirect immunofluorescent assay (IFA). A monoclonal antibody (Mab) against *C. burnetii*, and a peroxidase-conjugated anti-mouse IgM, were used as an indicator system competing with antibodies in animal serum, or as an indicator of the absence of antibodies. Sera were considered antibody-positive when the percentage inhibition index (PI index) was more than 30. The PI index was calculated as 100-[sample OD/Mab OD]*100]. Of the 162 bovine serum samples, 23 samples were antibody positive by both cELISA and IFA.

News source: **Rural Development Administration (RDA), Suwon, Korea**

For further information, *Korean Journal of Veterinary Research* 40,1:81-85.