MR 219, a new high-yielding rice variety with yields of more than 10 mt/ha

A NEW rice variety, MR 219, has been developed by the Malaysian Agricultural Research and Development Institute (MARDI). It was officially released in January, 2001. It was the first variety to be developed by means of a direct seeding planting system. Selection from F2 to F6 of the segregating generations was done visually, using a direct seeding system. The emphasis was on the panicle component characters, mainly the grain size and the number of grains per panicle. As a result, a single grain of MR 219 variety can weigh as much as 28 – 30 mg, and the number of grains can be as high as 200, higher than that of rice varieties previously released. The capability of this variety for producing high yields depends mainly on these two components.

Other good characteristics of this variety include a short maturation period (105 – 111 days), fairly tall but strong culms, and resistance to blast and bacterial leaf blight, while the rice can be marketed as a long-grain variety.

In addition, the cooked rice of MR 219 has a soft texture (Amylase content of 21.4%), as preferred by most local consumers. The planting area of this variety in the first season after it was released was estimated to be about 30% of the total major rice granary areas. The coverage rose to about 48.4% in the second season of planting. With good water management and additional input of fertilizers, the MR 219 variety is capable of producing yields of more than 10 mt/ha.

News source: MARDI, Malaysia
For further information, E-mail: alias@mardi.my

Modeling and simulation of modified atmosphere packaging for fresh fruits

MODIFIED atmosphere packaging (MAP) is established by packing the fruit in a sealed permeable film. This allows self-modification of the atmosphere inside the package through respiration of the fruit, and concurrently diffusion of the respiratory gases across the permeable film.

The effectiveness of this packaging method was verified with fresh papaya, pineapple and mango, and also with minimally processed jackfruit, pineapple and durian, under simulated handling conditions.

Verification results showed that the packages were capable of modifying the atmosphere so that it was close to the composition of about 2 - 5% O₂ and 5 - 10% CO₂ recommended for the controlled atmosphere (CA) storage of tropical fruits. The required concentrations were achieved after about three days in storage, and were maintained within this range throughout the four to six weeks in storage. (the length of storage depending on the type of fruit).

The ethylene concentration inside the packages was low, indicating that little ripening had occurred during the storage period. Quality analysis after storage and ripening showed a highly acceptable quality for the fruit packed in these packages. The use of MAP was able to maintain high quality and extend the shelf life of fruit, to an extent comparable to CA storage. While CA storage needs sophisticated facilities and is costly, MAP is a cheaper technique and suitable for storage during transportation, especially for distant markets.

News source: MARDI, Malaysia
For further information, E-mail: msp@mardi.my
**Prey preference and voracity of two major predatory mite species**

The influence of developmental stage and prey density on the behavior of two species of predatory mites was studied. The two predatory mites were *Neoseiulus longispinosus* (Evans), and *Proprioseiopsis mexicanus* (Garman). The study used the red spider mite, *Tetranychus urticae* Koch, as the prey.

For both species, eggs and larvae were the preferred prey, closely followed by the nymph. The adult stage of the spider mite was the least preferred prey. There were some minor differences between the two predator species. *P. mexicanus* preferred larvae to eggs, while *P. longispinosus* had an equal preference for eggs and larvae.

In general, the functional responses were adequately described by Holling’s (1959) Type II model. The rate of consumption of a young unmated female differed greatly from that of a gravid female. During a 24-hour observation period, using the eggs as the prey, we noted that gravid females at a density of 20 eggs/female maintained a consumption rate which was higher by 70%, although the rate tapered off at between 35 – 40 eggs/female, i.e. the threshold density, indicating that the saturation point had been reached.

The models are:

- *Neoseiulus longispinosus*  
  \[ N_e = \frac{1.0683N_t}{1+0.0118N_t} \] \text{for gravid females;}  
  \[ N_e = \frac{0.960N_t}{1+0.0394N_t} \] \text{for young females} 

- *Proprioseiopsis mexicanus*  
  \[ N_e = \frac{0.9744N_t}{1+0.0096N_t} \] \text{for gravid females;}  
  \[ N_e = \frac{0.852N_t}{1+0.010N_t} \] \text{for young females}.

Gravid females also demonstrated a higher searching rate (a’) as well as a shorter handling time (T_h), indicating that when gravid the females were more voracious. This would increase the probability of successful establishment, a fact that should be borne in mind when initiating a biocontrol program. The trend of consumption for both predatory mite species was evidently density-dependent up to a certain prey threshold, implying that both species have the ability to stabilize the prey-predator interaction.

**News source:** UPM, Malaysia

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**Irradiation as a quarantine treatment for mites on chrysanthemums**

*Chrysanthemum* is the most important temperate flower exported from Malaysia. It is often infested by various pests such as mites and thrips. The current pest disinfestation treatment is an insecticidal dip. The use of low ionizing radiation has been suggested as an alternative.

The criterion for efficacy of radiation as a quarantine treatment is not immediate mortality, but the inability of treated mites to reproduce at a new location. Irradiating the red spider mite *Tetranychus piercie* at a dose of 300 Gy, produced sterile adult females from irradiated protonymphs, while 400 Gy produced sterile adult females from deutonymphs.

A lower dose of 200 Gy induced sterility in the female adults which developed from irradiated eggs and larva. The damage caused by the irradiation treatment was reflected in the immature spider mites by their reduced emergence rate and higher mortality rate in subsequent development stages. A dose of 280 Gy prevented reproduction in adult females of *Tetranychus piercie* by inducing sterility, while a much higher dose of 5000 Gy is required to produce instant mortality. Large-scale testing showed that deutonymphs require 350 Gy to produce sterile adults.

According to these results, gamma irradiation at around 350 Gy may be applied as a quarantine dose to sterilize all stages of *Tetranychus piercie*, since all stages may be present in a consignment of chrysanthemum. The cut chrysanthemum flowers can tolerate 200 – 400 Gy, depending on the variety. However, if the stalks are placed in a 4% sucrose solution, all chrysanthemum flowers can tolerate doses of 900 Gy. Thus, it would seem that the quarantine sterilizing dose for *Tetranychus piercie* is 350 Gy, and is suitable for use on chrysanthemums.

**News source:** MARDI, Malaysia

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