THE IMPLEMENTATION OF RICE SUPERIOR VARIETIS

HIGH-YIELDING RICE VARIETIES

Rice variety is one of the main technologies that can increase rice productivity and farmers' income. With the availability of rice varieties that have been released by the government, farmers can now choose varieties that are in accordance with local environmental conditions, have high yields and have high selling value. Rice varieties are the easiest technology to adopt by farmers because this technology is cheap and very practical.

A. What is a variety

Variety is a group of plants or type or species characterized by the shape of the plant, growing plants, leaves, flowers, fruits, seeds, and expression of characteristics of the genotype or combination of genotypes that can distinguish from the same type or species by at least one defining trait and when propagated it does not change.

B. Types of varieties

There are several kinds of variety based on how the derived and their genetic consitutent such as:

1. Inbred rice variety

   An inbred rice variety is a pure line. This means that the offspring or succeeding generations produced by this variety will have the same genetic makeup. It is the result of crossing between two or more different varieties and subsequent selection through several cycles of self-pollination or inbreeding.

2. Hybrid rice variety

   A hybrid is the first-generation offspring of a cross between two genetically diverse parents. When the right parents are selected, the hybrid will have both greater vigor and yield than either of the parents.

3. Local rice variety

   The existing variety that has been cultivated for many generations by farmers and belongs to the community and under government authority.

4. Transgenic rice variety

   Any rice plant that carries a foreign gene(s) is introduced through genetic engineering techniques. Rice plants are regenerated from transformed cells and progenies and tested for the desirable agronomic trait(s).

A new high-yielding rice variety refers to the variety developed through the breeding process. High demand for rice because of population increase, and global climate change need higher yielding rice variety with multiple resistance to pests and disease, and tolerant to abiotic stresses. In Indonesia, there were more than 300 varieties with various advantage traits that have been released and some are available in the market. A new high-yielding rice variety usually has one or several advantage traits, it was difficult to develop a variety with many desired traits/complex traits. The new rice variety will show its advantages if planted at the right time and

right condition. Therefore it is important to know the property of each variety and buy the right variety as our need.

In Indonesia, there are four main rice varieties according to agroecosystems, they are irrigated rice varieties, rainfed lowland rice varieties, upland rice varieties and tidal swamp rice varieties. In each agroecosystem, each variety has a special advantage trait for being well adapted to their environment.

Beside based on the rice agroecosystem, another consideration for choosing the variety is based on the following character:

a. Good grain quality (especially cooking characteristics, color, shape, taste and aroma, and head rice recovery).
b. High market price.
c. Optimum yield potential and stability over seasons.
d. Maximum tillering capacity for weed competition.
e. Resistance or tolerance to major diseases, insects, and other stresses (i.e. drought and flood) of the area.
f. The right growth duration (maturity length) to match the season.
   We need to avoid varieties that need to be planted or harvested earlier or later than surrounding rice fields to minimize pest damage (e.g., birds during maturation), and growth problems during times of harmful environmental conditions (e.g., late-maturing varieties running out of water).
g. Resistance to lodging under normal farmer management.

QUALITY SEEDS

Sowing good quality seeds leads to lower seed rate, better emergence (>70%), more uniformity, less replanting, and vigorous early growth which helps to increase resistance to insects and diseases and decrease weeds.

The use of certified seeds and seeds with high vigor is highly recommended because (1) quality seeds will produce healthy seeds with lots of roots, (2) good seeds will produce uniform germination and growth, (3) when transplanted, seedlings from good seeds can grow faster and tougher, and (4) good seeds will get high yields. Grain can be grouped into two groups, namely grain with high density (HD) and grain with low density (LD). Grain with HD has a specific gravity of at least 1.20. Meanwhile, for grain with low density (LD), the specific gravity of grain is 1.05 or even less. Grain with HD had a low rate of seed abnormality. In seeds with a high density of grain, leaf width and weight as well as the amount of carbohydrates used by seeds were higher than those with a low density of grain. In the field, seeds from high-density grain will be better than seeds from low-density grain. Good quality seeds can increase plant growth and yield.

YOUNG SEEDLING

Younger seedlings will produce higher tillers than older seedlings. In endemic areas of golden snails, older seedlings are recommended. To get good seeds and plant growth, pay attention to the following:

A. Nursery preparation

After the fully filled seeds are separated from the half-filled seeds, before being distributed in the nursery the seeds are rinsed so that they do not contain a solution of fertilizer or salt, to be soaked for 24 hours and then drained for 48 hours. Nursery beds are made with a width of 1.0-1.2m with a length varying according to land conditions. Nursery area usually 400 m^2 width. The area of this bed is enough to spread 20-25 kg of seeds. Efforts are made to ensure that the nursery is close to water source and has good drainage, so that the nursery can be irrigated quickly and dry if necessary. Keep the nurseries from lamps to avoid the presence of pests.

B. Use organic materials in the nursery

When preparing the nursery, mix for every m^2 of beds about 2 kg organic materials such as compost, manure, or a mixture of various materials such as compost, manure, sawdust, ash, rice husks. The addition of organic material facilitates the removal of rice seeds so that root damage can be reduced.

C. Protect rice seeds from pests

Rats are very fond of freshly sown rice seeds. Therefore, various efforts to control plant pests need to be carried out at the time of nursery. Make a plastic fence around nursery to prevent rat attacks. This effort will be more effective if the nurseries of each farmer are close together, or even together in one nursery location. Install traps on plastic fences to control rats early on.