

Let's think about seed quality <Part 1>

Introduction: Why is the quality of seeds in developing countries low?

Quality of seeds in Japanese market is extremely high. Compared with other countries, the quality required in the Japanese market is severe - probably the world's most. A Japanese farmer said that he expected the germination rate of seeds to be 102%. It means that a packet of 100 seeds usually contains at least 105 seeds, so he expects to obtain unless 102 seedlings from the bag, one would not call them good seeds. It was a half joke but half serious. One reason for this demand for extremely high quality is vegetable production in Japan is highly specialized nature as well as labor saving strategies and mechanization. At the same time, it maybe also because of the Japanese characteristics to seek efficiency and quality, hating waste.

On the other hand, in developing countries, quality of seeds is always mentioned as a challenge in agricultural production. Often, low quality of seeds is blamed for low yields. However when hearing carefully details of the problem surrounding the low yield, the issue lies with cultivation management techniques. When we visit their plot after hearing the complaint that "because of poor quality of seeds, germination rate is low," we often witness other factors in the farm which prevent good germination rates, including damping off problems. In addition, when we ask what exactly is the problem with the seed quality, answers are often related to varietal characteristics rather than seed quality, such as "yields are low" or "we need disease resistance". In the general sense, varietal characteristics can be included in seed quality. However from the technical perspective, they should be considered separately. In many countries and regions, we hear rumors about seed producers mixing different types of seeds in a package or a different kind of seed is packed with a wrong label.

That is, although seeds are an essential material for plant production, they are often receiving unfair review due to the fact that it is hard to ascertain quality from the looks and because of simple misunderstandings. At the same time, seeds receive over-expectation by farmers believing that good seeds lead to good yields.

In developing countries, it is true that seed quality tends to be low. There are several possible reasons for this. One reason is that when seeds are produced in their own countries, basic cultivation management is often lacking. Mother plants have to be very healthy to obtain healthy seeds. Especially for leaf and root vegetable, and fruit vegetables which harvested immature fruits, as it requires a longer cultivation period than fresh vegetable production, extra care for maintaining plant vigor and pest and disease management is needed. However, for eggplant, cucumber and bitter melon, we witnessed cases where farmers were harvesting fresh fruits from mother plants that also produce seeds. This will naturally lower seed productivity and their quality, because nutrients that should be used for producing high quality seeds are also used for fresh production. Also in

order to produce seeds with high genetic purity, it is essential to carefully select mother plants and to eliminate off-type plants. However, this was rarely done properly due to lack of human resources with the knowledge and ability to identify off-type plants. We also witnessed cases whereby insufficient measures were taken where there was an outbreak of seed-borne disease in seed production fields.

After seed harvest, in some cases, the storage environment was inadequate, or no consideration for managing dew condensation that is formed when seeds are taken out of a low temperature storage. In other instances, cleaning of seed processing machine was inadequate. In developing countries with limited materials, they do not necessarily have adequate packaging materials.

So should they import seeds from developed countries? That is not necessarily so. This is because interests of export companies that may be holding low quality seed stocks which they hardly sell, and interests of import companies that would like to purchase seeds cheaply even if they are not the best quality, may often match. This may be natural because commercial business is based on gauging the balance between quality and price. However, this is one reason why cheap low quality seeds get distributed in developing countries' markets.

Furthermore, even if sufficient measures are taken to ensure seed quality on the part of the supplier, if seeds are displayed at retailers in an inadequate condition for a long period of time, or if packages are opened for loose sell, the risk of seed quality deterioration and mixing of different types becomes high.

As shown above there are many risks for seed quality loss. In order to ensure seed quality, there is a need for a standardized quality management through the entire seed value chain, from production sites to retailers. However, in developing countries, it is not easy to ensure the enabling conditions. As a result, many farmers are obliged to produce their crops using low quality seeds.

Given the above, in this series, we would like to introduce stories from the field and further examine this issue, focusing on our effort related to seed quality within our support for agricultural production.

Table: Criteria of seed quality

(1) Maintaining characteristics peculiar to variety
(2) Free from pests and diseases
(3) High genetic and physical purity
(4) High germination ability and vigor
(5) Retention of specific appearance of the variety, with full mature, and good drying and cleaning

Adapted from "Shubyo Dokuhon"
(Japan Seed Trade Association – JASTA)