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Germinated Oil Palm (*Elaeis guineensis*) Seeds: Process Innovations to Improve Seed Quality and Performance of Nursery Plants

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The quality of germinated oil palm seeds and nursery practices at planting affected emergence and plant vigour. ASD of Costa Rica has implemented several innovations to the seed germination process which have increased the proportion of germinated seeds that give rise to better quality plants in the prenursery phase. A special machine was designed that mechanically separates the mesocarp from the seed while reducing the amount of fibres that remain adhered to the seed shell to a minimum, and avoiding that these fibres become a substrate for storage fungi that may affect germination. More recently, another machine was developed that works on fresh bunches arriving from the field, and mechanically separates the fruits with spikelets facilitating the subsequent separation of the individual fruits. This process is very fast and reduces mechanical damage to the seeds to a minimum when compared with manual separation of spikelets using an axe.

Another important advancement has been the substitution of plastic bags for semi-hermetic plastic containers to keep the seeds during storage and heat treatment to break dormancy. This resulted in better control of seed moisture that allowed faster and more uniform germination with subsequent improved plantlet quality. More recently, ASD implemented the use of a "film coating" to identify its seed varieties with different colours and at the same time improve fungal control by mixing the polymer with a fungicide.

*Research on factors that affected seed quality was focused on how fast the seeds germinate after breaking dormancy and the effect of storage fungi. The impact of planting poor quality seeds on plant vigour was investigated as well. It was found that the percentage of emergence after sowing and the number of good quality plantlets were inversely proportional to the time required for breaking dormancy. Seeds with signs of contamination by storage fungi (such as *Penicillium* sp.), or with an abnormal germination (abnormal radicle or plumule) did not germinate or give rise to abnormal plants. All these factors are seriously considered during selection of commercial hybrid seeds.*

The use of premium quality germinated seeds assured the establishment of good nurseries, but did not prevent losses due to poor management. Some good quality seeds did not germinate or gave rise to poor plants when planted in an inadequate substrate (clayish and water saturated soils) or without shade early after sowing.

Keywords: Oil palm, seed germination, seed quality.