Fon Siam Agricultural Technology Co. Ltd.
99/296 President Park, Sukhumvit 24, Klongtoey,
Bangkok 10110, Thailand
Tel.: +66-99-337-7866; +66-86-339-6038 Fax: +66-2-661-1752
E-mail: artemisandangelcoltd@gmail.com Website: www.fonsiam.com

Growing Rice With Bio-Plant and Pro-Plant

Photograph shows the 1litre size of bottle.

3. Planting Rice
Planting Technique: Transplanting

What is Transplanting?

This method is carried out by transplanting seedlings that are grown in a nursery first.

Transplanting of rice seedlings into puddled fields is widely practised in Asia, primarily to better control weeds.

Transplanting requires less seed but much more labour, and the crop takes longer to mature because of the transplanting shock. The seedling needs to recover from being pulled out of the soil in the nursery It needs to reproduce fine rootlets.

How Old Do the Seedlings Need to Be?

Before being transplanted, seedlings are grown for different lengths of time in the nursery:

- **Traditional varieties** are transplanted 40 to 80 days after seeding.
- **Improved varieties** are transplanted within 20 days after seeding.
- **Machine transplanted seedlings** are transplanted 15 days after establishment.

How to Pull Rice Seedlings

To pull seedlings from seedbeds for transplanting:

- Hold two or three rice seedlings between thumb and index finger. Be careful and make sure to hold the seedlings close to the root.
- Position the index finger perpendicular, and the thumb parallel to the seedlings.
- Exert a little pressure downwards before slowly pulling seedling towards you.

How to Transplant Manually (by hand)

On loamy and clay soils, transplanting is delayed for 1 to 3 days after the final working because the soil is too weak to support the seedling.

In some sandy soils, transplanting is undertaken within hours of final harrowing in case the soil becomes too hard to manually implant the seedling. In areas where there has been insufficient rain and the soil is hard, transplanting may also be done in non-flooded soils by using a stick to make a hole to implant the seedling.

Manual transplanting of seedlings is very labour-intensive. Depending on the soil, you might need 20 to 30 people a day to plant 1 hectare of rice!

Seedlings should be planted at 1.5 centimetres of depth.

Seedlings

Transplanting

Planted

Manual transplanting is done either at random or in straight-rows.
In the **random method**, seedlings are transplanted without a definite distance or space between plants.

Transplanting at random

When transplanting is done at random, equal distances between hills are difficult to determine but it is essential that the estimated distances should not be too close or too wide (not less than 10 cm and not more than 25 cm) to compliment control of weeds through early shading by rice canopies.

Plant spacing is an important factor in transplanting rice. Proper spacing can increase the yield by 25% - 40% over improper spacing. You will also save money on inputs, labour, and materials.

The **straight-row** method follows a uniform spacing between plants. The seedlings are transplanted in straight rows.

Transplanting in Straight Rows

With this method you will need planting guides to have uniform spacing. Planting guides are made of wire, twine, and wood. Set the planting guides in the field before transplanting. Make sure the roots and base of the seedlings are inserted into the soil right under the loop or mark on the planting wire.

Planting Guides

Marker with teeth spaced at 20 cm - 25 cm.

The wooden marker is also used to transplant in straight rows. Mark the rows with a wooden marker of desired width and with the teeth spaced at 20 cm or 25 cm.

Pull the marker straight along the length of the field and then pull it over the width to make the lines cross. Plant the seedlings where the lines cross.

Planting in straight rows will make it easier to weed or apply fertilizers, herbicides, or insecticides. More importantly, you will get the best plant spacing.

Plant Spacing

Plant spacing is an important factor in transplanting rice. Proper spacing can increase the yield by 25% to 40% over improper spacing. You will also save money on inputs, labour, and materials.

Straight rows facilitate management practices such as hand or rotary weeding and application of fertilizers, herbicides, or insecticides. Optimal plant spacing may also be achieved through this method.

Transplant 2−3 seedlings of 15−21 days wet-bed or dry-bed grown seedlings at 20 cm x 20 cm spacing.

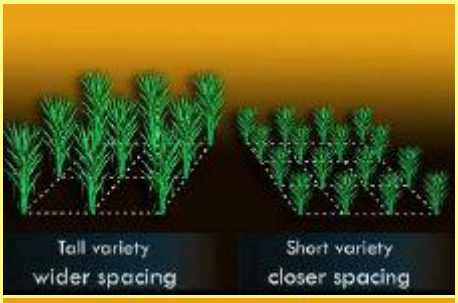
Closer spacing (15 x 15 cm or 10 x 10 cm) may be used depending on the availability of planters and the cost of transplanting. This is advantageous when weed control is inadequate.

Spacing of Plants

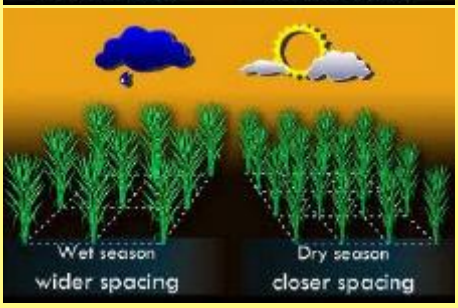
Proper spacing can increase grain yield. It minimizes shading and regulates the utilization of solar radiation for photosynthesis.

Let's see which factors determine the right plant spacing:

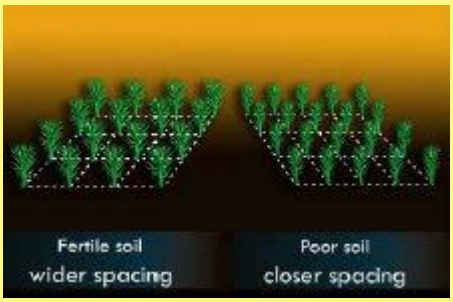
Variety is the first factor that determines plant spacing. Regardless of the season, tall, leafy, heavy tillering, and susceptible to lodging rice varieties should be placed farther apart than short, lodging-resistant, and photoperiod-insensitive varieties.



Season is the second factor. Plant the seedlings closer during the dry months, when solar radiation is higher, than during the rainy or wet season. Plants become more vegetative during the wet season. This increases mutual shading.



Soil fertility is the third factor. Plant the seedlings farther apart in fertile soil and closer in poor soil. Distance prevents mutual shading in fertile soil, while plants grown in poor soil tend to have tillers, thus, they can be planted closer together.



With the factors contributing to good yields, we advise that tall, leafy, heavy-tillering varieties are spaced:

During the dry season: 25 cm by 25 cm in relatively poor soil, 30 cm by 30 cm in fertile soil.

During the wet season: 30 cm by 30 cm in relatively poor soil, 35 cm by 35 cm in fertile soil.

Place the short, lodging resistant, and photoperiod-insensitive varieties at 20 cm by 20 cm regardless of season. However, desirable spacing in less fertile soils must be at 20 cm by 15 cm or 20 cm by 10 cm.

How to Transplant Mechanically (by machine)?

While the majority of rice fields in Asia are manually transplanted, a number of different transplanters are available. Machines with varying levels of complexity are manufactured in China, Japan, South-Korea and Taiwan. Machines range in size from two-row, walk-behind models to eight-row, ride-on models.

Most mechanical transplanters place seedlings in rows 30 cm apart with in-row spacing determined by forward speed.

Land must be well prepared for machine transplanting. The soil needs to be level and have sufficient bearing strength to carry the machine and support the planted seedlings. Fields may need to be drained one or two days longer than they are for hand transplanting.

Seedlings for mechanical transplanting

Mechanical transplanting

Machine transplanted

If we use transplanting as the method to plant then we should make sure we have a proper nursery to grow the seedlings.