

# What is No-Till Farming ?

The Farmers' Handbook - "The Fields", Chapter 3 - No-Till Farming

In the 1960's a Japanese agricultural scientist called **Masonobu Fukuoka** started to ask himself how he could reduce the cost of his farming methods. He saw most costs in ploughing, weeding, fertilizing and



*Fields not ploughed for 6 years,  
Sunrise Farm, Kathmandu, Nepal*

transplanting paddy in his rice-wheat system. He spent the next 30 years experimenting to perfect his methods of reducing farming costs in these areas. But now, using his experience, we can develop similar systems in a much shorter time. His methods are also called "**farming of the sages**", because of the deep spiritual base to his philosophy, and the fact that nature is regarded with godly respect. His methods are based upon natural systems, and farming practiced without harming nature.

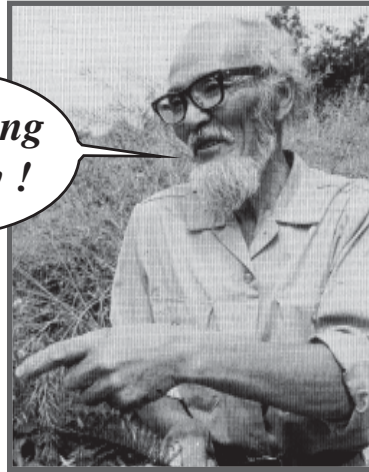
Farming with nature can be practiced with any farming system, but the methods described in this chapter are particularly related to the **rice and wheat** system.

# Why do No-Till Farming ?

There are 3 main reasons for ploughing:-

- to aerate the soil;
- to reduce weeds;
- to mix organic matter in the soil.

*Ploughing is crazy !*



*Masonobu Fukuoka*

If we can achieve these needs without ploughing, then why plough ? This was Fukuoka's idea.

A plough is never used in the forest, but the soil is always soft and fertile. In fact, the more you plough, the more ploughing is

needed, as weed seeds are brought to the surface and germinate. Ploughing leaves the earth bare, leaving micro-organisms and nutrients to be dried out

by the sun, washed away by the rain, and blown away by the wind. That's why it's difficult for farmers to get good production even after so much hard and expensive work ploughing, weeding, etc.

Farming without tillage does no harm to the environment. Without tillage, the natural soil life will keep the soil loose and fertile by itself, which also greatly lightens the farmer's work, and reduces cost.

*I'm a soil's friend*



# How to do No-Till Farming ?

There are examples of traditional no-till systems. One example is before cutting rice, lentils are sown and grown without ploughing.

In a good mulching system crops are grown without digging, and by using some green manures such as velvet bean, no-till systems have been developed. More information about these are given in the *Mulching* and *Green Manures* chapters.

In this chapter information is given about a no-till method of growing **rice** and **wheat**.

## Materials Needed for No-Till Farming

wheat and rice seed



white clover seed



wheat straw



rice straw



well rotted compost

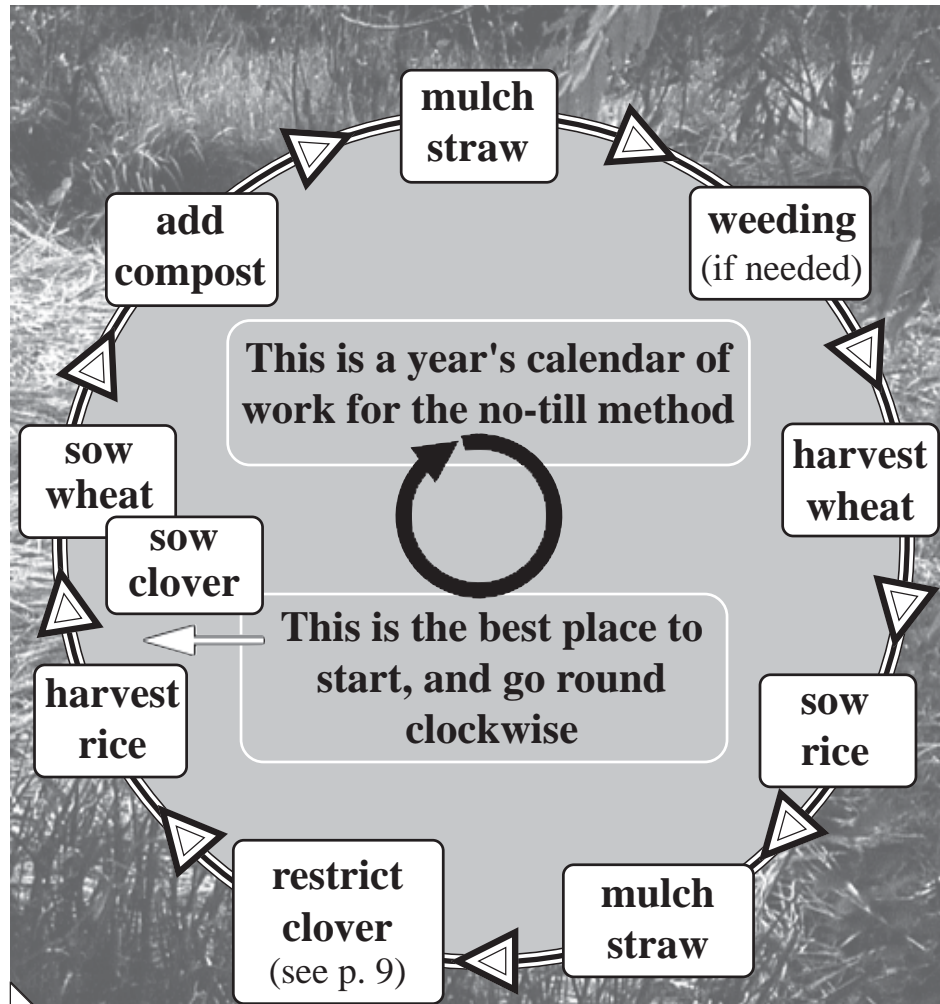


This is the start of Fukuoka's method:-

- ① After harvesting summer rice, plough one last time.
- ② Sow wheat seed.
- ③ Thickly sow clover seed.
- ④ Mulch the wheat and clover with the straw from the rice crop.

In this way, the wheat and clover germinate together. Wheat grows up above the clover, and clover grows on the ground. Below the clover is the straw mulch.

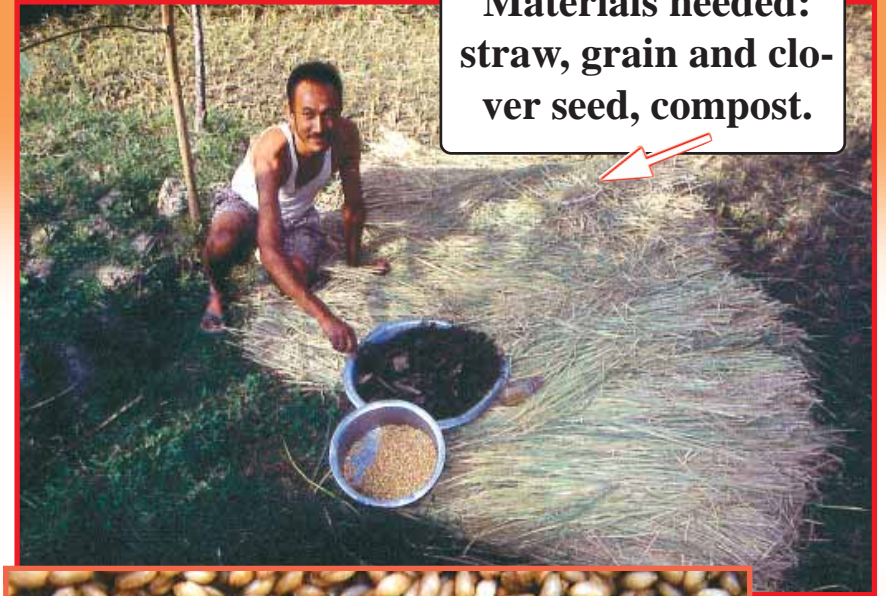
Clover works as a green manure. By covering the soil, it helps to smother weeds and conserve moisture. It also fixes nitrogen in the soil. Nitrogen made naturally like this does the same work as urea fertilizer.



# Let's See

## how to do No-Till Farming

**Materials needed:**  
straw, grain and clover seed, compost.



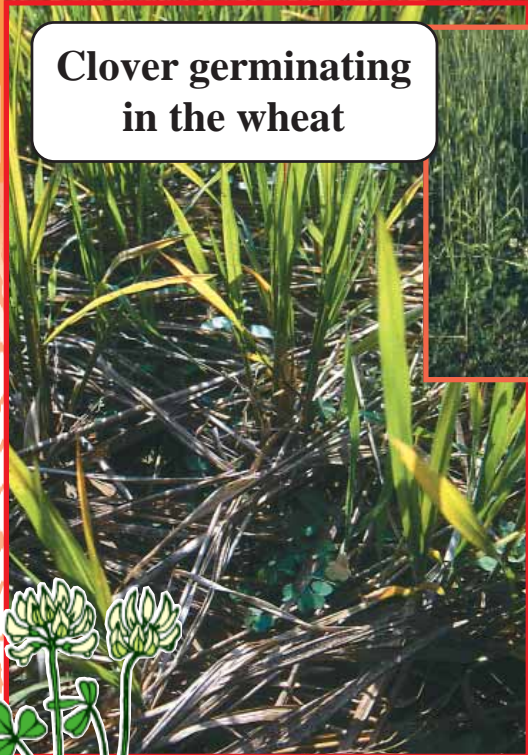
clover seed close up



**Sowing wheat**



**After wheat, sow clover**



**Clover germinating in the wheat**

**This shows the wheat growing with clover underneath**

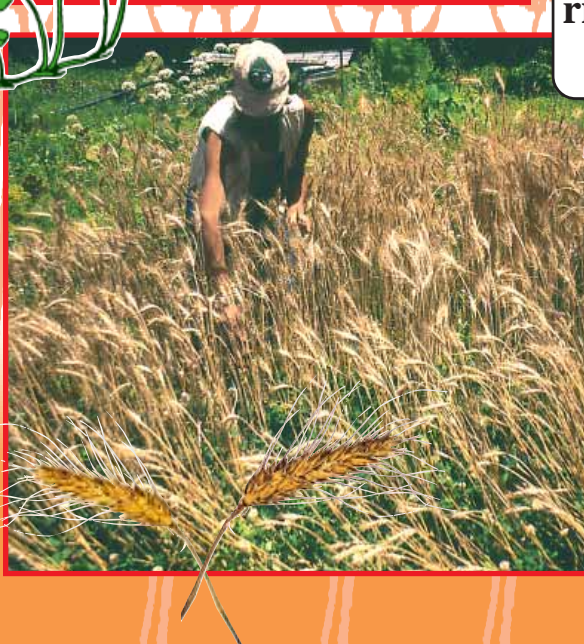
**Here the wheat is ripe and underneath the clover is green**



**Spread a little compost**



**Cover everything with rice straw**



**After wheat is cut, sow rice and mulch with wheat straw**





Close up of wheat and clover growing together.

After harvesting rice, the wheat is sown without ploughing.



Before sowing, soak wheat and rice seed and mix with powdered clay.



While mixing, spray with water



This makes a clay coat around the seed which protects it from birds. Another method is shown on p.10.

# Maintenance

## How to maintain a No-Till System

As the wheat ripens, any weeds should be removed. At first, more weeds will grow, but after the thick ground-cover of clover grows, and without tilling, weeds will reduce.

Sow rice after the wheat is harvested. As the rice grows, there is a danger that it will be smothered and prevented from growing by the thick ground cover of clover. There are 3 ways of preventing this :-

1. Flood the field for 10-12 days. This weakens the clover and the rice can grow through and above it. Then drain the water. The ground cover of clover will recover, and the rice will have grown away from its competition.



In the summer rice is flowering, while underneath clover is doing the weed control.



- If there is a shortage of water as the rice is germinating, allow livestock to graze the clover. But only allow this once, for a short time, and then remove the livestock. They will eat down the clover, so the rice can grow up and away. The clover will again recover as the ground layer.
- After sowing the rice, the clover can also be cut. It can be used as a fodder for livestock, or as a mulch. Then add the wheat straw mulch, and weed as necessary.



Another method of coating seed with clay. Here, clay is made into a thick paste, mixed with rice or wheat seed, and pressed through a 5mm sieve.

### Try your own research

There are many ways of working with nature to reduce work such as ploughing, weeding, etc. The most important thing is to understand the principles of the methods. Instead of wheat, barley or oats can be used. Timing will be different for different places and climates. It may be better to sow the rice before the wheat is cut, or sow wheat before rice is cut. This method may seem difficult at first, but this is no reason to give up. Try it out first on a small plot, and increase the area as experience grows.

## Farmers' Experience

**Mrs Sanumaiya Shrestha**

**Mrs Sanumaiya Shrestha lives at Sunrise Farm in Sita Paila-4, Kathmandu, Nepal. She has experience in no-till farming, so let's hear her story.**



*Mrs Sanumaiya Shrestha*

“ I really like the no till method. Wheat and clover are sown together and covered with the rice straw, which also helps to protect them from birds. Then, if there's no rain, we may need to irrigate. Rice is sown in just the same way, without having to raise the seedlings in a nursery. The day before sowing either rice or wheat, I soak the seeds to help them germinate quicker. As soon as rice is cut, I sow the wheat, and as soon as the wheat is cut, I sow the rice. Sometimes a little weeding may be needed, but not often. There's more weeds at the beginning, but much less later on. Now all the work of digging is saved. Before, we did all the digging and the yield was the same, and now we get the same yield without the digging. Doing less work to get the same yield must be a good method, isn't it? ”





# Read On !



## Subjects Related to No-Till Farming

This book provides enough information for you to be able to try your own No-Till Farming. However, this information is also linked to other methods. For extra benefits let's read, learn and practice from other related chapters.



### Agroforestry chapter

Only when there's a plentiful supply of fodder from the land can the straw from grain crops be used for mulch in a no-till method. In this chapter, read about how to integrate trees on farms .



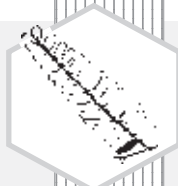
### Mulching chapter

Mulch keeps the soil covered, keeps weeds down and conserves water. This chapter shows how to mulch the soil while still growing other crops.



### Green Manures chapter

By sowing green manures with crops, fertility is increased and with less work there are more benefits. Learn how in this chapter.



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