

# Composting Rice Residue

## What is compost?

Compost is the relatively stable product that results after organic materials — such as crop residues and animal manure — decompose. Compost usually contains relatively low amounts of major nutrients. In general, carbon (C) is reduced and other nutrients are concentrated during composting.

## Why compost rice residue?

Composting converts crop residues into a better organic fertilizer. Although organic fertilizers, including rice compost, are often low in major nutrients such as nitrogen (N) and phosphorus (P), they can be highly beneficial because they contain micronutrients, enzymes and micro-organisms that are often not found in inorganic fertilizers. Rice straw is rich in potassium (K).

Table: Fresh weight content

Organic material	C (%)	N (%)	P (%)	K (%)	Ca (%)
Rice Straw	41	0.5-0.8	0.05-0.1	0.3-2.0	0.03-0.17
Fresh cattle manure	8-10	0.4-0.6	0.1-0.2	0.4-0.6	0.2-0.4
Composted cattle manure	30-35	1.5	1.2	2.1	2.0

## How to create compost from rice residues

After harvesting or milling, the straw or rice husks are placed in piles. Here are some tips for good results:

1. The keys to good compost making are adequate N supply and moisture content and abundant micro-organisms.
2. Composting is best when sites are level, well drained and under shade, and when compost materials are chopped into small pieces (3-5 cm).
3. If possible, compost heaps should be built in layers consisting of cereal crop material (high C and low N content) combined with legume or manure wastes (higher N content). Mix in a ratio of 2:1 (cereal:legume/manure). Many farmers leave the rice straw in large piles where it lands after threshing, but this is not the best method.
4. Compost heaps should be kept moist — not too wet (e.g., no water draining from the compost pile) and not too dry (e.g., straw so dry it cracks when bent)
5. To aid decomposition, sprinkle your compost heap with decaying material (e.g. cow dung slurry, cow urine), a dilute solution of N fertilizer (such as urea) and/or with a micro-organism solution (e.g., *Trichoderma harzianum* commonly called "tricho"). Such additives are desirable because they contain nitrogen and/or microorganisms that aid decomposition.
6. Many farmers build compost heaps and then just let them stand, but it is best to mix and turn the heaps every two weeks.
7. When moisture and temperature conditions are good, compost will be ready in 4-8 weeks.



Farmers often leave rice straw to decompose where it lands after threshing, but this is not the best method (see above)

## Advantages of compost:

- Compost contains a range of micronutrients and micro-organisms that are beneficial to crop growth and soil health, and which are not usually contained in inorganic fertilizers.
- Composting concentrates the nutrients in otherwise poor quality rice by-products.
- Nutrients in compost are released slowly and are less likely to be lost by leaching.
- The high temperatures generated in composting (above 55°C) keep pathogen levels low and reduce the viability of weed seeds contained in the compost material.
- Once compost is ready to use, it is easy to handle (it is fairly stable and has little odor).
- Organic wastes are widely available on farms.

## Limitations of compost:

- Collecting and piling organic wastes, turning compost heaps and spreading compost in the field can require a lot of labor.
- Farmers may need to apply a lot of compost to obtain enough nutrients to achieve high yields. For high-yielding crops, inorganic fertilizers are usually needed as well as compost.
- Compost usually only contains 1/20<sup>th</sup> to 1/30<sup>th</sup> the N content of common inorganic fertilizers.
- Not all of the nutrient in compost is available to crops during the year of application (compared to 100% availability of N in ammonium fertilizer, for example).

## For more information:

Visit the Rice Knowledge Bank:  
<http://www.knowledgebank.irri.org>

Developed with input from M.A. Bell, V Balasubramanian and J.F. Rickman