Measuring Moisture Content of Rice

What is moisture content

Moisture content (MC) is the weight of water contained in paddy or rice expressed in percent. MC is usually referred to the wet basis meaning the total weight of the grain including the water (MC_{wb}). For research moisture content referred to the dry matter of the grain is sometimes used (MC_{db}).

Why is measuring moisture content important

Accurate moisture content testing is important in managing and marketing paddy and rice. Inaccurate tests lead to:

- Extra drying cost and harvesting loss if paddy is harvested wetter than necessary
- Spoilage if the grain is too wet in storage
- Extra drying cost and loss of quality if paddy is dried too far
- Lower head rice when milled at wrong MC
- Weight loss (loss in profit) if grain is sold too dry

The optimum grain MC depends on the desired storage duration.

MC, %	Purpose
<9	Storage for more than one year
9-13	8-12 months storage
14	Optimum milling yields
14-18	2-3 weeks of storage
>18	Rapid deterioration

How to measure moisture content

Oven Method

Use a temperature controlled oven. Make sure that the temperature is not higher than specified because otherwise chemical changes occur within the grain which can cause additional weight loss:

- Set the oven at 130 ºC.
- Weigh three paddy samples and place the samples inside the oven.
- Measure the final weight of the samples after 16 hours.
- Compute for the moisture content wet basis (MC_{WB}) using the equation (1):
- Compute the average MC.

Using a moisture tester

Quick moisture testers are most suitable for use in the field and for trade. To operate a quick moisture meter follow these basic steps:

- Read the operators instruction.
- Make sure the batteries are good.
- Turn on the moisture meter and ensure that the machine is set for paddy or rough rice.
- Fill the tray/bowl of the moisture tester with paddy samples.
- Turn/press the knob until the moisture reading is displayed.
- Test at least three samples.

Make sure that you turn the knob all the way as described in the manual. If the knob is not turned far enough you will get a wrong reading.

Calculations

$$MC_{wb} = \frac{m_i - m_f}{m_i} * 100 \quad (1)$$

$$MC_{db} = \frac{m_i - m_f}{m_f} * 100 \quad (2)$$

MC_{wb}	=	Moisture content wet basis	[%]
MC_{db}	=	Moisture content dry basis	[%]
m_i	=	Initial weight	[g]
m_f	=	Final weight	[g]

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