ANNEX

Project of Fact Finding Survey for Poverty Reduction and Sustainable Agricultural Development in Myanmar

2015
T. Shibata

Purpose of Research in 2015

It is necessary to improve the quality of rice so that rice miller can sell rice with high price. Purpose of research in 2015 is to research present condition and training to record each figures with detail numbers for below contents.

●Reduce rice price loss because of quality loss

●Reduce rice amount and price loss during storage

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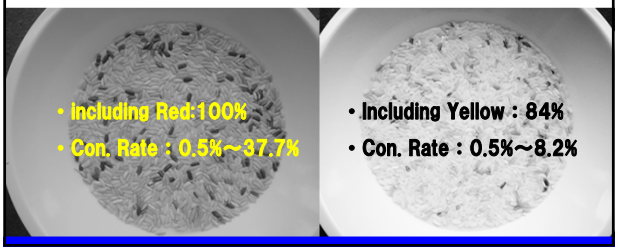
Value Loss of Rice

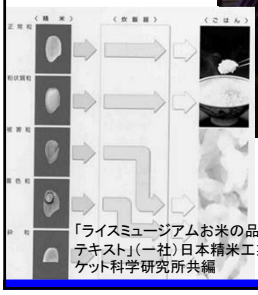
Inclusion of red or yellowed rice decreases the value of rice and its brand image

●Inclusion of red rice
・Price loss by 10～20%
・Refused by rice millers if large amounts

●Inclusion of yellowed rice
・Price loss by 5～20%
・Refused by exporters even if small amounts

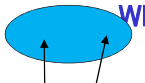


Training on analysis and standards for rice using Japanese quality evaluation text



「ライスミュージアムお米の品質評価テキスト」(一社)日本精米工業会／ケット科学研究所共編

What's moisture content



D + m = W

$$\text{Wet Moisture (M) \%} = \frac{W\ kg - D\ kg}{W\ kg} \times 100$$

W: Rice Weight, D: Weight of Dried Provisions, m: Weight of Water

Calculate weight after drying rice with moisture content M1%, weight W1kg to moisture content M2%.

$$M_1\ \% = \frac{W_1\ kg - D\ kg}{W_1\ kg} \times 100 \quad - ①$$

$$M_2\ \% = \frac{W_2\ kg - D\ kg}{W_2\ kg} \times 100 \quad - ②$$

Delete Dkg from ① and ②

$$W_2\ kg = \frac{100 - M_1\ \%}{100 - M_2\ \%} \times W_1\ kg$$

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Measurement Method of Moisture Content

Method

●Direct Method

Remove all moisture from rice, and calculate moisture content based on weight difference after and before drying.

・Standard Method：Grind 5g rice. and dry up 5 hours with 105℃.

・Infrared Moisture Meter

●Indirect Method

Calculate moisture content based on physics character. (correct by direct method)

・electric resistance type

・electric capacity type

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Rice Moisture Contents Data Sheet

RICE MOISTURE CONTENTS DATA SHEET

Data Sheet No.				Date	6. 12. 2015
T/S Name		Farmer Name			
		Rice Miller Name			
Remark					

Sample No.	Variety	P: paddy B: Brown W: White	Product Year	Moisture Contents (%)						
				Moisture Meter						Infrared Moisture Determination Balance
				1	2	3	4	5	Average	
1.	Ayeyawadi	P	2014	13.6	13.6	13.5	13.7	13.6	13.6	
		B	2014	13.4	13.6	14.0	14.7	13.8	14.2	
2.	Manawthuka	P	2015	14.6	14.0	14.8	14.1	14.1	14.1	
		B	2015	14.4	14.7	13.5	14.5	14.5	14.5	

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Procedure to measure moisture content

●Handy Moisture Meter(Electric Resistance)

①Record result after 5 times measurement

(Remark: Keep grinded sample into plastic bag)

②Ignore maximum and minimum value, calculate average value of remaining values.

●Infrared Moisture Meter

①Use same sample which used for handy moisture meter. (Grinded)

②Set infrared moisture meter FD-720 as below.

	Temp.	Weight	Mode	
Paddy:	120℃	7g	AUTO	0.05%
B/Rice:	120℃	7g	AUTO	0.05%
W/Rice:	120℃	7g	AUTO	0.05%

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Key Point of Measurement of Moisture Content

●Paddy

・Moisture content of paddy is not even, so please measure minimum 5 times and calculate average.

●Brown Rice : Husk paddy and measure moisture content

・Moisture content of brown rice may be higher than paddy because moisture content of husk is lower than brown rice.

・Control of moisture content of paddy during storage can be done by measuring moisture content of brown rice. For this case, please husk paddy by manual husker.

●White Rice: Mill brown rice and measure moisture content of white rice.

・During milling, rice will be dried up because of milling heat. So moisture content of white rice will be lower 0.2-0.8% than brown rice.

・Measurement result by electric resistant type moisture meter will be higher than actual value if it will be used for rice with high temperature. So please wait until temperature will be same as room temperature by keeping rice in plastic vacuum bag.

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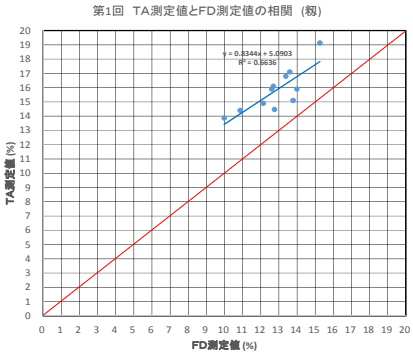
Measurement of paddy moisture content with the calibration curve for Japanese rice



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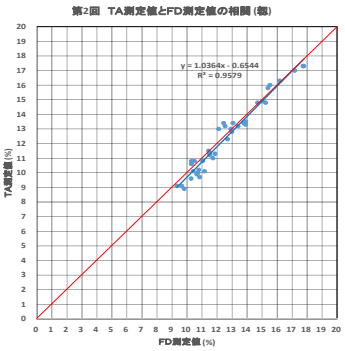
Measurement of paddy moisture content with the calibration curve for Myanmar rice



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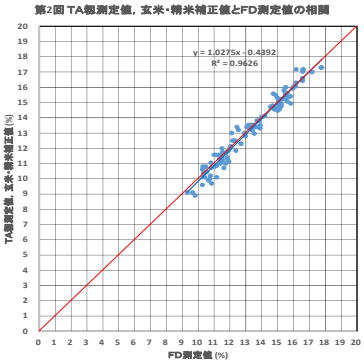
Measurement of paddy, brown and white rice moisture content with the calibration curve for Myanmar rice



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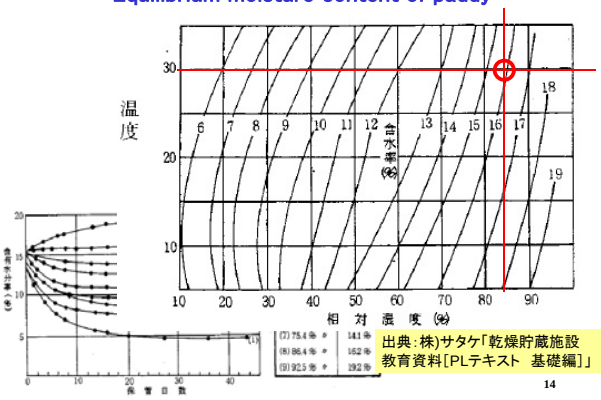
Equilibrium moisture content of paddy



出典：株)サタケ「乾燥貯蔵施設教育資料[PLテキスト　基礎編]」

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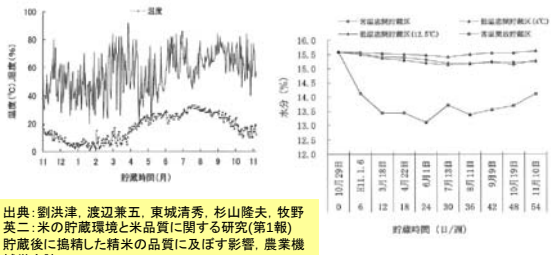
Change over time of Paddy Moisture Contents in Japan



出典：劉洪津，渡辺兼五，東城清秀，杉山隆夫，牧野英二：米の貯蔵環境と米品質に関する研究(第1報)貯蔵後に搗精した精米の品質に及ぼす影響，農業機械学会誌 64(1), 52-60, 2002

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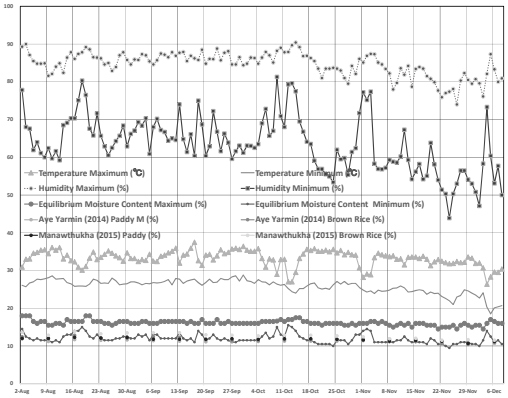
Change over time of Paddy Moisture Contents

Measurement of paddy and brown rice moisture content every Saturday

Installation of 2 data loggers which record temperature and humidity every 30 minutes

Change over time of Paddy Moisture Content



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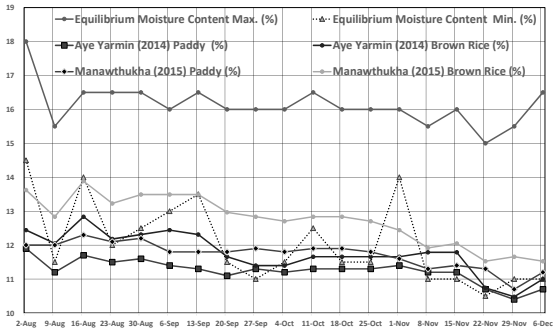
Change of Paddy Moisture Content by Equilibrium Moisture Content



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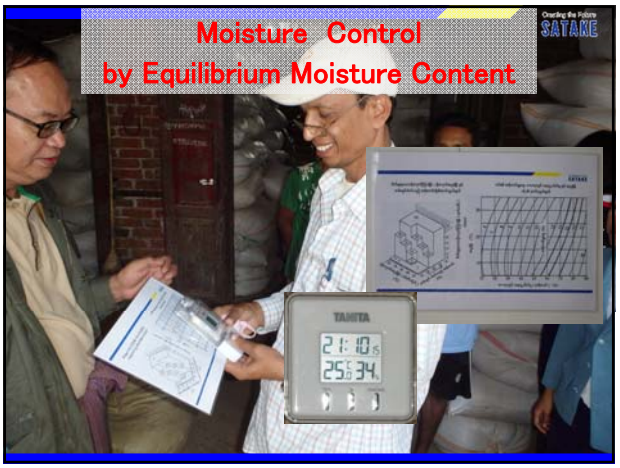
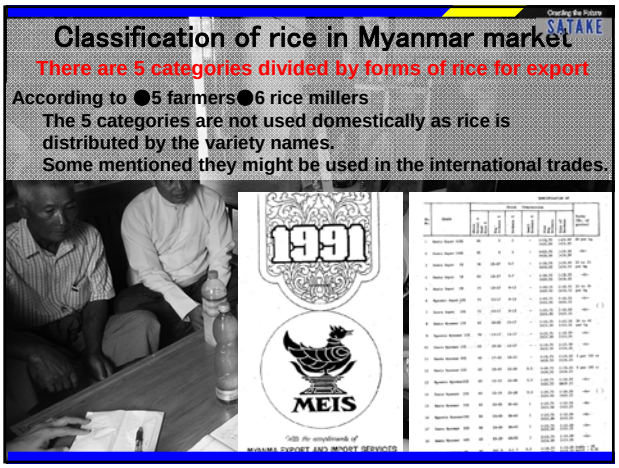
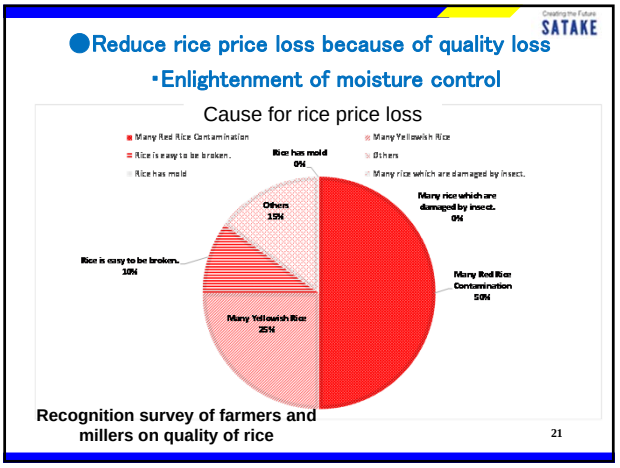

Moisture Control
by Equilibrium Moisture Content
SATAKE
TANITA


Classification of rice in Myanmar market
SATAKE
There are 5 categories divided by forms of rice for export
According to ●5 farmers●6 rice millers
The 5 categories are not used domestically as rice is distributed by the variety names.
Some mentioned they might be used in the international trades.
1991
MEIS


SATAKE
●Reduce rice price loss because of quality loss
・Enlightenment of moisture control
Cause for rice price loss
Many Red Rice Contamination
Rice is easy to be broken.
Rice has mold
Many Yellowish Rice
Others
Many rice which are damaged by insect.
Rice has mold 0%
Many rice which are damaged by insect. 0%
Others 15%
Rice is easy to be broken. 10%
Many Red Rice Contamination 50%
Many Yellowish Rice 25%
Recognition survey of farmers and millers on quality of rice
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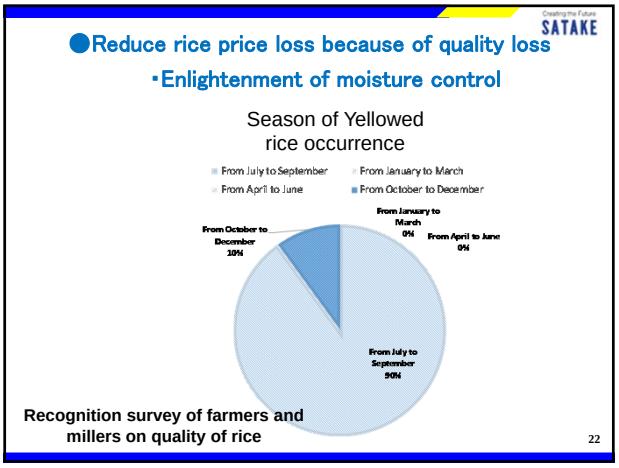
SATAKE
●Reduce rice price loss because of quality loss
・Enlightenment of moisture control
Season of Yellowed rice occurrence
From July to September
From January to March
From April to June
From October to December
From January to March 0%
From April to June 0%
From October to December 10%
From July to September 90%
Recognition survey of farmers and millers on quality of rice
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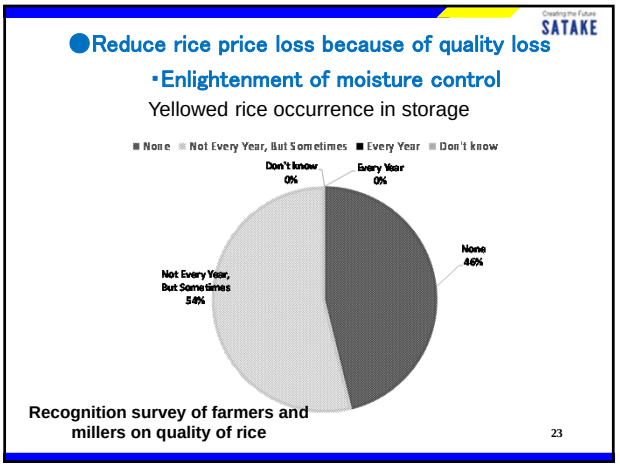
SATAKE
●Reduce rice price loss because of quality loss
・Enlightenment of moisture control
Yellowed rice occurrence in storage
None
Not Every Year, But Sometimes
Every Year
Don't know
Don't know 0%
Every Year 0%
None 46%
Not Every Year, But Sometimes 54%
Recognition survey of farmers and millers on quality of rice
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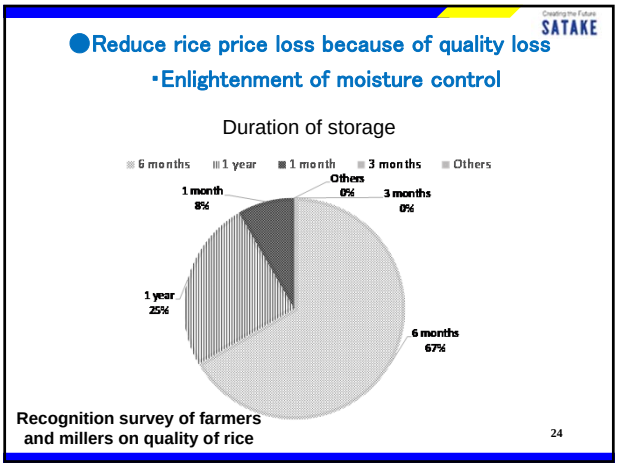
SATAKE
●Reduce rice price loss because of quality loss
・Enlightenment of moisture control
Duration of storage
6 months
1 year
1 month
3 months
Others
Others 0%
1 month 8%
3 months 0%
1 year 25%
6 months 67%
Recognition survey of farmers and millers on quality of rice
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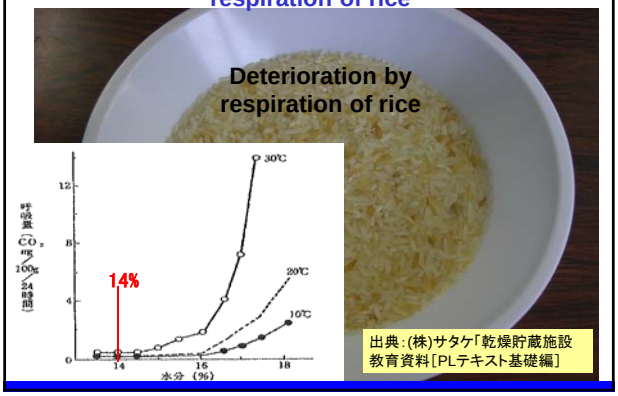
Relations among moisture, temperature and respiration of rice



Issues left over from projects in 2015

1) Fact-finding survey on price loss

・Necessary to obtain actual picture of price loss across the country

・Necessary to set quality standards for Myanmar rice shown in pictures, charts and tables

2) Moisture control

・Necessary to promote a numerical management system of moisture by using moisture meters

・Necessary to set standards for paddy moisture content

3) Environment survey during storage (changes of paddy moisture over time)

・Necessary to have a confirmation test during full-fledged rainy season in June ~ July

4) Promotion of a joint purchase of machinery and equipment

・Necessary to build an organization like agricultural corporation to introduce combines and dryers

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《Collectivization of Agriculture》

Primary sector remains low-income, primary + secondary sector or 6th sector industrialization will add value to products

●Cultivation

●Processed Vegetable

●Quality Control

●Rice Milling