

Preparation of high quality hay along the Bulgan River Valley



Hay making in Bulgan

Benefits of haymaking

Haymaking is one method of conserving grass for feeding animals during winter and spring in Mongolia. Hay is made from fresh grass with a moisture content of 70% by sun drying, taking it to a moisture level of 20% or less, so that it can be stored effectively.



Irrigation channel besides hay fields

Hay yield and irrigation

The hay yield depends on the climate (mainly rainfall and temperature), soil properties (primary the organic matter content) and pasture management (fertilizing, seeding etc.). The hay yield along the Bulgan river ranges from 2 to 7 t/ha. Due to low rainfall amounts hay fields should be irrigated up to 6 times per season to increase the yields. Especially at the beginning of the season (late spring) water is needed for regrowth of vegetation, whereas no water should be applied shortly before harvest.

Ice/Snow irrigation is an approach to water hay fields in the early spring in succession of melting. During the winter water from streams and springs and snow are spread over the hay land. The ice and snow melting provides water at a time when vegetation has great need in the early spring.

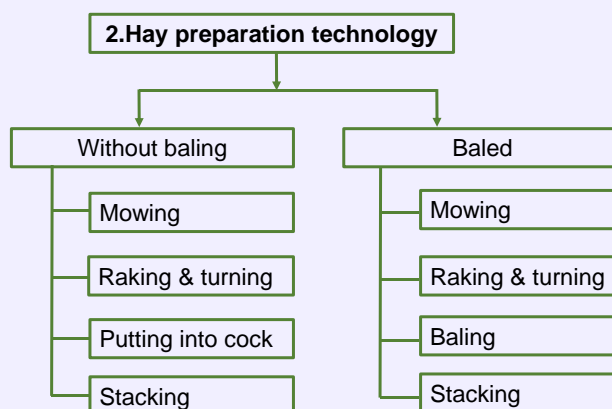


Mowing grass with a small tractor with simple harnized scythe.

Time of harvesting

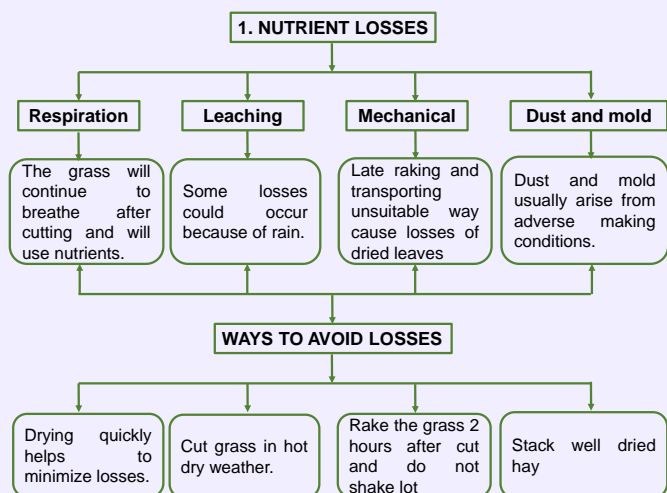
Herbage should be cut at the mid-flowering stage which is best to maximize its digestibility and energy levels. This stage occurs at the end of July and beginning of August along the Bulgan River Valley. But during this period mostly rains so harvesting plan should be related to weather forecast to avoid raining effects.

If you cut in September you may have a dry forage, but its feed value is limited.



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Nutrient losses and ways of solution



Common way to transport the hay to the winter camp

Quantifying prepared hay

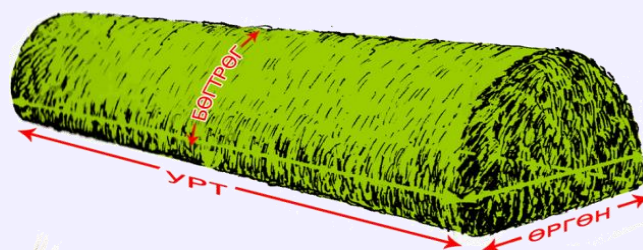
To estimate the amount of hay in a stack, you need to (1) calculate the volume of hay, and (2) know the weight of hay per cubic meter.

Volume of hay in rectangular stacks

The volume for square, flat-topped stack is determined as follows:

$$(0.56 \times O) - (0.55 \times W) \times W \times L$$

Where, O is the “over” or “over-throw,” which is the distance in meter from the ground on one side of the stack, up and over the stack and down to the ground on the other side; W is the width; and L is the length.



Volume of hay in haycock stacks

Бүхлын эзэлхүүнийг олохдоо Бү - бүслүүр. Бө - бөгрөг гэсэн 2 хэмжээ авах бөгөөд дараах томъёог ашиглан эзэлхүүнийг олно.

$$\text{Э} = (0.004 \cdot \text{Бө} - 0.012 \cdot \text{Бү}) \cdot \text{Бү}^2$$



Hay in cocked stack

Practices	Reasons	Benefits
Mow forage early in day	Allow one full day's drying	Faster drop in moisture.
Form into spread swath	Increase drying rate.	Less respiration loss. Less likelihood of rain damage. High quantity and quality.
Rake or turn at 40%-50% moisture content	Increase drying rate	
Bale hay at 15-18% moisture	Optimize preservation.	Less leaf scatter. Inhibition of molds and browning. Low chance of self-ignition (fire).
Store hay under cover.	Protect from rain, sun	Inhibition of molds, browning Less loss from rain damage.

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Nutrient losses and ways of solution

After the volume computation, average weight in cubic meter is determined using table 2.

2. Weight of hay (kg) per 1 m³

Locations	How many days after stacked			
	3-5	14	30	90
Lower land in Bulgan	37	40	45	50
Upper land in Bulgan	42	45	50	55

Method of estimating the weight of hay if bales are stacked

Take ten hay bales to a facility with a scale, such as the local feed store. Take the bale's average weight and multiply that by the number of bales in the stack.



Irrigation channel besides hay fields

Example. You want to estimate the amount of hay in the stack that has settled for 30 days. The stack is 20 meter wide, 30 meter long and has an over of 40 meter.

The answer is secured as follows:

- Volume = $(0.56 \times 40) - (0.55 \times 20) \times 20 \times 30 = 6840 \text{ m}^3$
- Table 2 shows that there are 50 kg of hay per cubic meter.
- $6840 \times 50 = 342,000 \text{ kg}$ or 342 tons of hay

Evaluation of hay quality

High quality hay has a high nutritive content (including crude protein (CP) and digestible energy) and a high intake and acceptability. It is low in cell walls and fiber (NDF, ADF and ADL) and free of defects such as dust, musty odor, mold, and excessive foreign material.

3. Chemical composition of hay in different locations along Bulgan River Valley

Conpo-nents	Study locations			
	Bulgan gol	Bayan gol	Khelgtii khad	Turgen
ME energy (MJ)	7.67	7.64	9.14	9.14
CP, %	9.43	10.00	10.57	12.66
Fat, %	2.78	1.72	1.97	2.28
NDF, %	60.83	66.32	61.75	59.02
ADF, %	36.42	35.62	34.62	36.04
ADL, %	12.78	12.03	13.32	18.18
Ca, g/kg	3.92	5.35	7.27	7.63
P, g/kg	1.37	2.39	2.24	2.04

Alfalfa is a perennial which features a high yield potential and nutritive value. Alfalfa hay is very digestible and can be high in crude protein, energy, vitamins, and minerals. Forage nutritive value has dramatic effects on livestock productivity (weight gain, reproduction, etc.), Alfalfa could improve the nutritive value of the hay to the nutrient requirements of the target animal.



Alfalfa field

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