effectiveness of agricultural vыiraschyvanyya cultures.

Selskohozyaystvennыe Machines, pokazatel Quality, Saving byolohycheskoy yield.

Paper aimed at improving the opportunities the realization biology bog water through effective uses of machines for rural economy, ones level of effectiveness effect on development of agricultural cultures.

Agricultyral mashines, indicator of quality, preservation byolohycheskoy yield.

UDC 631.36: 62-664.2

FORMATION OF OPERATIONAL CONTROL OF QUALITY OF BIOMASS PRODUCTION solid biofuels

SV Dragnev, Ph.D.

Proved methods of sampling biomass in terms of agricultural production. Made compulsory for

indicators and methods of quality control systems operational biomass in the production of solid biofuels.

Biomass, sampling, test methods, operational control, Quality, solid biofuel.

Problem. In the production of solid biofuels is important to ensure guaranteed quality biomass of agricultural origin at all stages of the process: collection, transport, storage and processing. Need to operational control of incoming raw materials, intermediates and output, allowing you to quickly and efficiently in terms of agro-industrial production to determine the parameters of biomass as regulatory requirements. This should be used simple techniques that can be implemented without any special training staff to conduct feasibility studies without the use of expensive laboratory equipment and require a minimum amount of the substance.

Analysis of recent research. For the production of heat and electricity use various types of biomass: agricultural, forestry, organic household and industrial waste and energy plantations. Differs from traditional biomass fuels (gas, oil and coal), lower density and calorific value (Fig. 1), seasonality, systems for storage, preparation and supply of boilers larger and more expensive, excessive moisture content,

thermochemical properties and chemical composition of solid biofuels varies and depends on the type of biological material (oxygen content of alkali metals, chlorine, etc.). Therefore, biomass systems, including the power subsystem, furnaces, gas cleaning and ash removal, developed specifically for certain raw materials, to ensure efficient fuel combustion, allowable emissions and reliable operation of equipment [1-3]. Granulation and briquetting biomass allows to significantly increase the bulk density and specific power consumption of biofuels, which simplifies logistics and reduces its cost of it, but it is time-consuming and energy-consuming process. Locally appropriate use of biofuels that do not require significant investment in production - cod, shorts and more. Burning straw chaff automates the process of applying and burning fuel, but even with local use in agro-industrial production is necessary to ensure proper quality of biofuels [4].

To regulate the market of solid biofuels in the EU implemented a system of standards, which is based on the classification of biofuels in accordance with EN 14961-1 origin and source and major trading forms and properties [5]. Technical Committee 335 "Solid biofuels» (CEN / TC 335 - Solid biofuels) developed and put in place standards norms for classification, requirements and methods of sampling and testing of solid biofuels. Agricultural biomass - specific raw material, effective processing of which requires permanent operational control of its quality in terms of agricultural production.

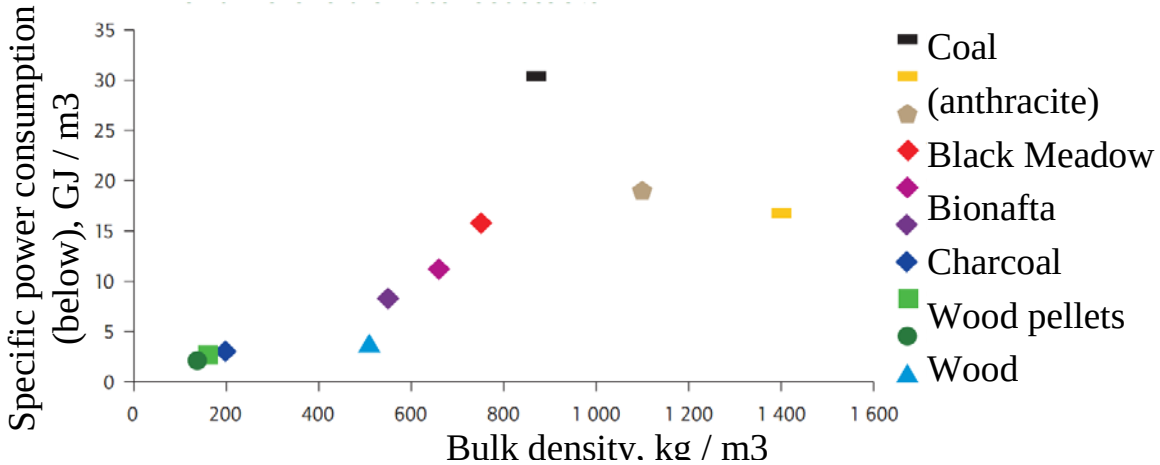


Fig. 1. Comparison of bulk density and specific energy consumption of various types of biomass [1].

The purpose of research. Develop a system of operational quality control in terms of biomass production in its agro-processing in solid biofuels.

Results. The main raw material for the production of solid biofuels in terms of agro-industrial production is herbaceous biomass, primarily

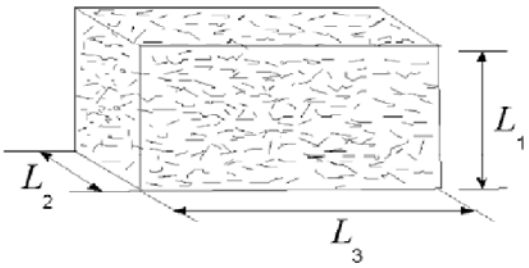
crop remains: straw; stems, leaves of corn and sunflower. In order to reduce the cost of transportation and storage grassy biomass pressed into bales bales or rolls. The list of quality indicators pressed grass biomass to be tested in accordance with EN 14961-1 «Solid biofuels - Fuel specifications and classes - Part 1: General requirements» are listed in Table. 1.

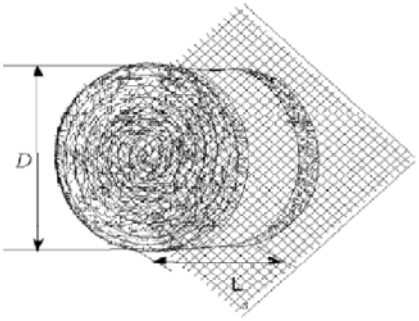
To determine the quality first sample biomass fuel use recommendations of European standards CEN / TS 14779 «Solid biofuels. Sampling. General requirements »[6], CEN / TS 14778-1« Solid biofuels. Sampling. Part 1. Methods for sampling »[7] and CEN / TS 14778-2« Solid biofuels - Sampling - Part 2: Methods for sampling particulate material transported in lorries »[8], the harmonization of which is expected in Ukraine national standardization plan for 2013 .

The basic principle of sampling is to obtain representative samples of specified amounts of biomass. Each piece of material or pidpartiyi party should be able to get a sample that is selected with equal probability [6].

1. Characteristics of pressed grass biomass

Origin:	1.1.1.2 straw of cereals 2.1.2.1 whole grass 2.1.2.2 straw of grass 2.1.3.2 stems and leaves of oilseed
Trading form	Round and square bales
Dimensions, m	





Regulatory

L1 - Height; *L2* - Width; *L3* - Length; *D* - Diameter

Round bales (rolls)	Diameter *D*City	Length *L3*City	
D1	1.2-1.5	1.2	
D2	1.6-1.8	1.5	
Square bales (bales)	Height *L1*City	Width *L2*City	Length *L3*City
P1	≤ 0,35	≤ 0,4	≤ 0,5
P2	≤ 0,9	≤ 1,2	1,5-2,8
P3	≤ 1,3	≤ 1,2	1,0-3,0
P3 +	Displayed actual value	Displayed actual value	Displayed actual value

	Bulk density *BD*Kg / m3	
	BD100	≥ 100 kg / m3
	BD120	≥ 120 kg / m3
	BD160	≥ 160 kg / m3
	BD180	≥ 180 kg / m3
	BD220	≥ 220 kg / m3
	BD220 +	> 220 (indicating maximum)
	Moisture *W*%	
	W10	≤ 10%
	W15	≤ 15%
	W20	≤ 20%

End Table. 1

Regulatory	W25	≤ 25%
	W30	≤ 30%
	W30 +	> 30% (point maximum)
	And Ash,% (on dry state)	
	A5,0	≤ 5%
	A7,0	≤ 7%
	A10,0	≤ 10%
	A10,0 +	> 10% (point maximum)
	Type biomass	Must be specified
	Heat of combustion *Q*, MJ / kg	
	Specific power consumption, *E*, W h / kg	
	The production process	It is recommended to specify the processes that may affect the particle size of the straw in the pile (eg, weather conditions, threshed or plant has been cut, or cut altogether)
Informative	Chlorine *Cl,* % (On dry basis)	
	Cl0,01	≤ 0,01%
	Cl0,03	≤ 0,03%
	Cl0,07	≤ 0,07%
	Cl0,10	≤ 0,10%
	Cl0,10 +	> 0.10% (point maximum)
	Fastening material	It is recommended to specify what sealed bales (net, twine, plastic)
	Fusibility of ash 0C	Point deformation temperature ash *DT*

Source: [5].

Before sampling is necessary after inspection of places of accumulation and storage to determine the number and volume of samples, make a plan. It is important to visually determine the amount of straw, which can be converted into solid biofuel separating a moisture (humidity over 40%) and rotten, placed in open stacks at the edges, bottom and top. For sampling biomass used shovels, probes, shovels and pitchforks, depending on the particle size of the material. For

sampling placer straw used shovels and pitchforks, with a boiling point of straw - hooks. Tools for biomass sampling should have a capacity of at least [7]:

$$V_{\min} = 0,05 \cdot d \quad \text{for d} \geq 10 \qquad (1)$$

Vmin - Minimum capacity tool for sampling, L;

d - Nominal top size of particles, mm.

When sampling biomass packs are carved pieces of not less than one liter. Spot samples are mixed in the combined sample.

The number of point samples determined by the formula [7]:
for sampling of the real material

$$n_{\min} = 10 + 0,04 \cdot M_{napmiї} \qquad (2)$$

for sampling from a moving stream

$$n_{\min} = 5 + 0,04 \cdot M_{napmiї} \qquad (3)$$

where *nmin* - The minimum number of point samples, rounded to the nearest whole number; *Mpartiyi* - The mass party or pidpartiyi, vol.

Operational control of the quality of biomass in the production of solid biofuels entrance, operational and acceptance control (Fig. 2).

Thermal Characteristics of biomass due to its moisture content and chemical composition. Index humidity changes and significant impact on processing technology biosyrovyny in solid biofuel. Just in terms of agricultural production, using visual control method (*VC*) Can be estimated color, odor, moisture uniformity, infestation by fungi, the presence of solids (earth, sand, etc.), Biomass particle sizes (maximum size of broken rice, bales or rolls), density, moisture content is determined by instrumental methods.

Biomass particle size of 200 mm using calipers determined in accordance with GOST 166. The physical dimensions of bales (rolls) tape measure with a scale division 1 mm per ISO 4179.

The density of biomass in terms of agro-industrial production by using the volume-weighted method: weighing certain amount of raw materials.

The density of broken rice determined as follows from samples biofuels filled cylindrical container of known volume of at least two dm3 and weigh it with an error of no more than 0.1%. Bulk density of biofuel (ρn) in kg / m3 calculated using the formula:

$$\rho_{н} = \frac{m_{n}}{V_{n}}, \qquad (4)$$

where IM - mass of biofuels in cylindrical containers, kg;

Vp - volume cylinder capacity, m3.

Result Rounds to an integer. For each test performed two parallel

determination of density and calculated average. The results of parallel measurements should not differ by more than 10 kg / m3.

For operational control moisture biomass should be used portable moisture meters, based on the sample, the measurement method used, providing accuracy of ± 1%. Information on operational quality control of biomass to be made in the test report (Table. 2).

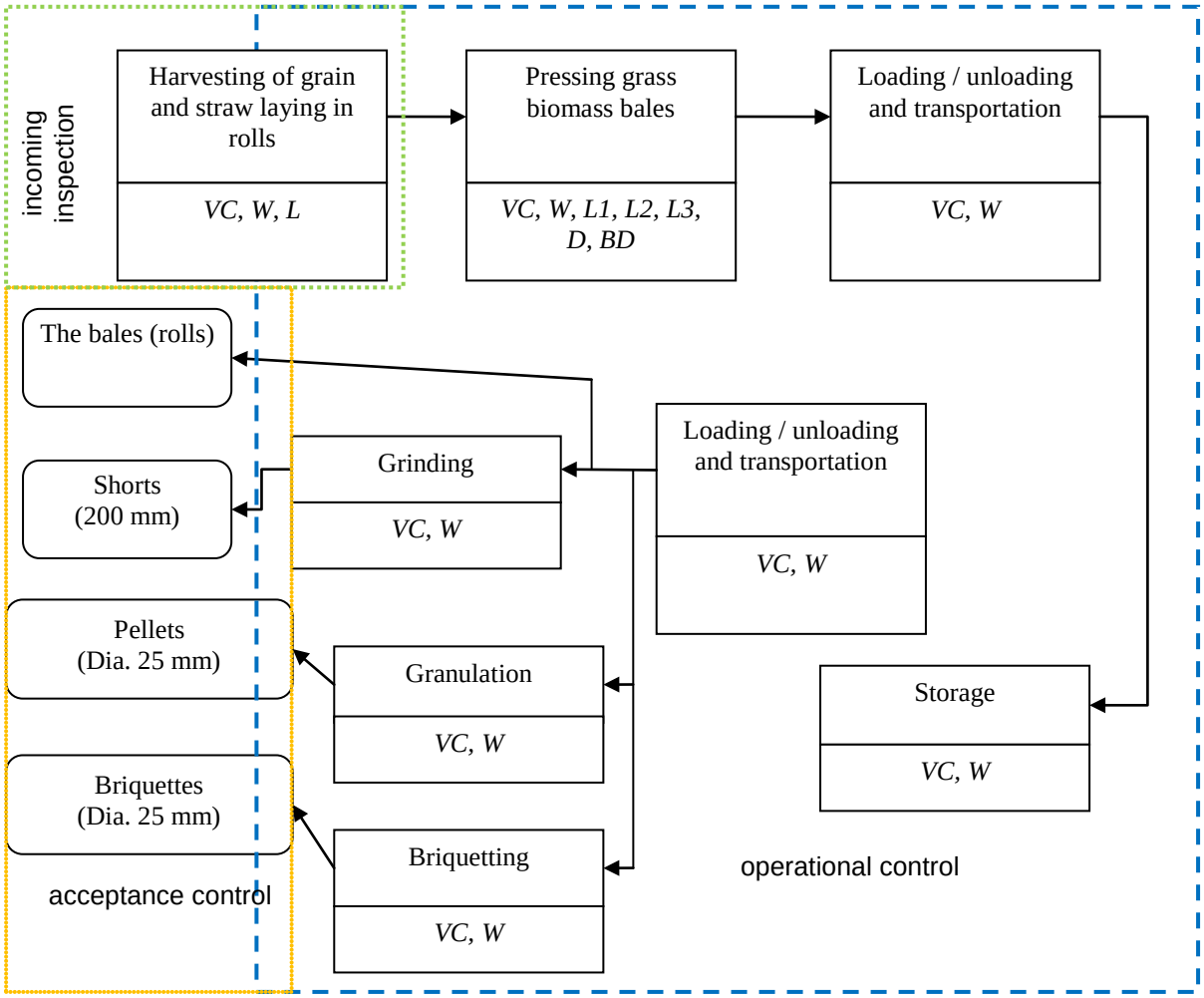


Fig. 2. Scheme of operational control as biomass.

2. Protocol operational quality control straw.

Batch number			Date
These soby who conducted the test			Time
Characteristics of the place of sampling			Type operational control: input operating control
Add a place of sampling			
Type biomass			
Supplier biomass			Comments
The weight or volume party t or m3			
Weight of test and packaging, kg			
Form biomass			

Sizes			
Date of harvesting straw			
Address Provider			
Address carrier			

End Table. 2

Address storage space				
Address space processing				
The purpose of sampling			Equipment for sampling	
Characteristic	Integer	Value		
Moisture	% By weight			
Density	kg / m3			
Visual quality assessment straw - color - smell - uniformity - fungi infestation				

Conclusion. In the production of solid biofuels in terms of agro-industrial production it is desirable to introduce reasonable system of operational control as biomass, based on the use of visual and instrumental (linear, volume-weighted sample, and measurement) methods for determining the parameters biosyrovyny. This uses the minimum amount of biomass and cheap measuring equipment that allows employees to quickly select samples of raw and choose rational modes of production equipment.

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Obosnovanы methods otbora samples byomassы in terms ahropromыshlennoho production. Opredelen obyazatelnыy list see system parameters and methods of operational quality control in the production of solid byomassы byotoplyv.

Byomassa, otbor samples yspытanyya method, operatyvnыy control, indicator of qualities, tverdoe byotoplyvo.

The biomass sampling methods under agricultural production conditions are substantiated. The obligatory list of parameters and methods of biomass operating control system for solid biofuels production is defined.

Biomass, operating control, sampling, solid biofuel, testing method, quality level.