The paper analyzes modern control systems of load machines. Described intelligent control algorithms lifting devices, based on the solution of dynamics inverse problem and application of fuzzy logic. Control algorithms reduce the qualifications of lifting mechanisms operators and can move "intelligence" of trained personnel in the control system.

Mode of motion, sensor, control crane, drive, feedback.

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SETTING GROUND improvements TECHNOLOGY transhipment for sugar beet

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The method for determining rational parameters of advanced technologies for shipments of sugar beet.

Sugar beet, harvesting, carriageEfficiency, productivity.

Formulation of the problem. An important way to increase the efficiency of harvesting and transport processes for sugar beet is the use of powerful combine harvester with large capacity bins combined with heavy vehicles and powerful loading and sewage treatment equipment. This trend must be seen in close connection with the problem of soil compaction during transport Root off.

It shows the direction of a foreign experience farm with a large volume of production [1], which is widely spread transhipment technology that improved use of specialized heavy-trailers perevanta zhuvachiv and highly-loader-cleaners.

Therefore, the actual development of methods substantiation of rational parameters of advanced technologies for shipments of sugar beet.

Analysis of recent research. For the first time in Ukraine reloading option shipments technology for sugar beet in the 70s of the last century was proposed by the All-Union Research Institute of sugar beet (m. Kyiv), but manufacturing application improved alternative technologies did not happen due to insufficiently high technical level of development as trailers and combine harvesters.IN recently in the EUWhen there are more sophisticated BC bunkers with high capacity - 40 m3 (company combines Ropa,Vervaet Beet Eater 625 and other) and

trailers Ruw Hawe capacity of 40 m3 tractor John Deere 8400 (Germany) etc. is inperfection shipments technology.

Research advanced streaming technology [1] constituents in assembly-transport sector (ZTK) Trailer-conveyors showed her some advantages compared with generally accepted technology in the economy of Ukraine. .In The same time, this technology I leave two significant drawbacks:

- for continuous operation beet harvesters (BC) subject to long distance transportation requires both significant amount of ATZ, which may not always provide the economy.
- the fields exported with root vegetables around 3% or more (by weight of beets) topsoil[2].

The experience of the EU, improving trans technologies through the use of powerful combine harvester with large capacity bins to carriage from BC to the piles (at the edge of the field) specialized tractor handling trailer (CCI) and a powerful truck-cleaner in a significant degree eliminates deficiencies .

The purpose of researchisincrease efficiency technologies for shipments of sugar beet by developing methods of rational justification of its parameters.

Results. An important advantage of specialized CCI to other vehicles (TC) is the reduced degree of impact on the ground. If conventional tractor trailers or ATZ specific pressure several times higher than the permitted limit, the specialized Chamber, through wide profile tires, this figure is close to normal.

Improved harvesting and transport staging workflow is as follows. A group of 3-4 BC working in the same field, but each in its zahintsi [3], With tops crushed and scattered as organic fertilizer. For fixed group BC group CCI. Tractor-trailer in the end filling hopper combine approaches to it, and root vegetables go boots and then moved to the edge of the field to the piles where unloaded and returned to BC. With truck-cleaner while cleaning roots from soil loaded with heavy ATZ and transported to the collection point of the sugar factory. To determine the operating parameters of technological units in engineering practice, the most common deterministic calculation models using analytical relationships.Number of harvesters required for harvesting from the area S, ha grain yield in the U, t / ha, is given by:

$$m_K = CEILING \frac{S \cdot U}{W_K T_{ЗМ} K_{ЗМ} Д_Р}, \text{ Ed.,} \quad (1)$$

Where: SEILING - function that returns an increasing nearest integer;

Rr - coefficient of variability (Rr = 3), which shows the number of changes (TZM = 8 hrs.), Which works combine a day;

DR - the number of days for harvesting grain ahrovymohamy - 30 working days - conditions forecast for 35 days (from 20 September to 25 October) [4].

BC Productivity per hour of time is variable

$$W_K = W_{KP}\tau \text{ T / hr.} \quad (2)$$

where W_{KP} - Productivity per hour working BC (basic) time;

τ - utilization of the time that is defined as

$$\tau = \delta_{3M}\tau_{Ц} = \delta_{3M}\varphi = 0,81; \quad (3)$$

δ_{3M} - Ratio of cyclic time changes adopted 0.9 [5];

$\tau_{Ц}$ - utilization of cyclic shift time factor is working strokes, the average value of which according to the literature accepted as $\varphi = 0,9$ [5, 6].

Productivity per hour working BC (basic) as time is

$$W_{\text{KP}} = 0,1B_P v_P U \text{ T / hr.} \quad (4)$$

where: B_P - Working width BC, m; v_P - BK operating speed in km / h; U - Yield, t / ha.

The working speed of the harvester v_P driven by yield roots. For beet harvesters of leading European companies could take such estimated rate movements (Table. 1)[4].

1. Working speed BC.

Root yield t / ha	The working speed of combine km / h.
30-50	11-8
50-70	8-6
70-90	6-5

The condition of the first stream links ZTK "BC - CCI" is equal[7]:

$$R_m = I_{П}, \quad (5)$$

where R_m - The rhythm of the group combines:

$$R_m = \frac{T_{ЦК}}{m_K}, \text{ H} \quad (6)$$

$T_{ЦК}$ - The duration, theobochoho cycle BC; m_K - The number of BC in the group;

IP- CCI interval proceeds to the point of interaction with the combine:

$$I_{П} = \frac{T_{ЦП}}{n_{П}}, \text{ H} \quad (7)$$

where $T_{ЦП}$ - The duration, theobochoho cycle CCI;

$n_{П}$ - The amount for maintenance of CCI combines.

Subject (6-7) from the equation (5) we obtain

$$n_{П} = \frac{m_K T_{ЦП}}{T_{ЦК}}, \text{ Ed.} \quad (8)$$

It is advisable To CCI equal load capacity hopper BC, that is:

$$q_{П} = q_{Б}, \quad (9)$$

The rhythm of a combine equal length, theobochoho cycle BC - $T_{ЦК}$ Which in turn contains a silo loading $t_{Б}$ and the duration of idle moves on turns tX, per 1 cycle of the combine, and defined as [4]:

$$R_1 = T_{ЦК} = t_{Б} + t_{X} = 1{,}11 t_{Б}. \quad (10)$$

The working cycle CCI $T_{ЦП}$ consists of the following components: $t_{ЗАВ}$ - Load Time Chamber of Bunker BK, $t_{РУХ}$ - The movement on the field for 1 turnover unloading and back to BC, tROZ - while unloading in piles and tOCh - waiting time for loading and presented in the form of an equation:

$$T_{ЦП} = t_{ЗАВ} + t_{РУХ} + t_{РОЗ} + t_{ОЧ}, \quad (11)$$

where: $t_{ЗАВ} = \frac{q_{Б}}{W_{ПК}}$, Hours

$q_{Б}$ - capacity bunker BK - maximum weight beets contained thereinT:

$$q_{Б} = V_{H} d_{В},$$

V_{H} - Capacity hopperM3;

$d_{В}$ - Volumetric weight beet t / m3;

$W_{ПК}$ - Performance vygruznogo conveyor BC, t / h.

Duration CCI movement in one of its turnover, according to experimental studies [8-9] $t_{РУХ} = 0{,}09$ h.

Duration unloading Root of CCI in piles as is

$$t_{РОЗ} = \frac{q_{Б}}{W_{П}}, \text{ Hours.}$$

where: $W_{П}$ - Performance vygruznogo conveyor CCI, t / h.

After substituting in (8) all values of its components get CCI amount for maintenance of harvesting as:

$$n_{П} = CEILING\ 0{,}9 m_K W_{КР} \left(\frac{1}{W_{ПК}} + \frac{1}{W_{П}} + \frac{0{,}09}{q_{Б}}\right), \text{ Ed.} \quad (12)$$

Number ATZ, which is necessary for continuous operation truck-conditioner (NO). is the condition of rhythmic second link "Chamber - ATZ", where we have:

$$R2 = I2, \quad (13)$$

where: R2 - the rhythm of a length of time equal to NO $T_{НО}$ its cycle:

$$R_2 = T_{HO} = \frac{q_A}{W_H \tau_H}, \quad (14)$$

where: W_{HO} - Productivity HO t / h;

τ_H - Utilization of working time changes HO; with proper organization of work τ_H = 0.8 [10].

q_A - Capacity ATZ, t, determined from the expression:

$$q_A \geq q_Б \quad (15)$$

I2 - ATZ interval income:

$$I_2 = \frac{T_{ЦА}}{n_A} = \frac{1,23(\frac{K_M \cdot q_A}{W_{HO}} + \frac{2l_{ij}}{v_T} + t_{АВИВ})}{n_A}, \quad (16)$$

where: n_A - The number of vehicles in the group;

$T_{ЦА}$ - The duration of one turnover ATZ;

K_M - A ratio that takes into account the time spent on maneuvering ATZ [5] (K_M = 1.5);

l_{ij} - Distance transport, km;

v_T - The average speed of technical ATZ km / h;

$t_{АВИВ}$ - Duration discharge beet collection point.

After substituting in (13) all the values of its components get ATZ service number for HO as:

$$n_A = CEILING \frac{1,23 W_{HO} \tau_H (\frac{K_M \cdot q_A}{\tau_H W_{HO}} + \frac{2l_{ij}}{v_T} + t_{АВИВ})}{q_A}, \text{ Ed. (17)}$$

The ability to reduce the amount of ATZ, which are used simultaneously determined variation of working time changes NO.

Studies show that for grain production [1], the use of CCI as an equalizer, eliminates downtime ATZ, which amount to direct traffic at 36%. Naturally, the same figures are transformed and ZTK for sugar beet.

Example calculation. Sugar beet harvesters going Ropa Euro Tiger (row 9) with a capacity of 40 m3 hopper (25.6 tons) and performance conveyor for unloading of beet bunker $W_{ПК}$ = = 720 t / hAnd transported to the edge of the fields in piles tractor trailer-conveyorsHawe Ruw with a capacity of $q_П$ = 26 and t productivity vygruznogo conveyor $W_П$ = 850 t / h. WITH piles roots loaded truck-cleaner Ropa Euro Maus with performance WNO = 350 t / h. on KAMAZ-45144 with a trailer GKB 83,500, with a total carrying capacity of 25 tons, which they are taken out at the reception center. The average transportation distance - 25 km,

engineering vehicle speed - 40 km / h, the car stay on the receiving point -
0.1 hours.

Define:area, which is going to yield (U = 60 t / ha) combines a group of three 30 working daysCCI number for serviceof harvesting ATZ quantity for export of beet piles at full load BUT.

Decision. At full load and combines under ahroterminu area from which the crop is going to a group of three machines (under recommendations [3]) is found from the equation (1):

$$S_{3mk} = \frac{m_K W_K T_{3M} K_{3M} Д}{U} = \frac{3 \cdot 138 \cdot 8 \cdot 3 \cdot 30}{60} = 4968 \text{ Ha},$$

BC where productivity per hour alternating time determined in accordance with equation (2):

$$WK = \text{T / hod.} 170 \cdot 0{,}81 = 138$$

BC productivity at work per hour (basic) time (4):

$$W_{KP} = 0{,}1 \cdot 4{,}05 \cdot 7 \cdot 60 = 170 \text{ t / h.}$$

CCI number for service Group 3 is harvesting(11):

$$n_{П} = CEILING\ 0{,}9 \cdot 3 \cdot 170(\frac{1}{720} + \frac{1}{850} + \frac{0{,}09}{25{,}6}) = 3 \text{ units.}$$

ATZ number for the export of beet piles at full loadNO is defined as (16):

$$n_A = CEILING \frac{1{,}23 \cdot 350 \cdot 0{,}8(\frac{1{,}5 \cdot 25{,}6}{0{,}8 \cdot 350} + \frac{2 \cdot 25}{40} + 0{,}1)}{25{,}6} = 20 \text{ units.}$$

Conclusion. The technique of definition of rational parameters of advanced technologies for shipments of sugar beets, which provides the harvester without downtimedecreases soil compaction, eliminates its removal from the field and makes it possible to optimize the timing and amount of roots transportation ATZ, which simultaneously apply.

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Predlahaetsya method definitions ratsyonalnыh parameters usovershenstvovannoy perevalochnoy technology for saharnoy beet.

Saharan beet,Other cleaning, transportyrov-ka,Efficiency,proyzvodytelnost.

The technique of definition of rational parameters of advanced technologies for transshipment of sugar beet.

Sugar beet, Cleaning, transportation, efficiency, productivity.

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TECHNOLOGY REVIEW processing of residual FEED FOOD AND ANIMAL LIFE

VS Hmelovskyy, Ph.D.

The article analyzes the processing of residual feed, feeding animals and disposal of manure on livestock farms and complexes.

The remnants feed, recycling, compost, zvorushuvach, manure, reducing costs.

Formulation of the problem. Research has shown that increasing the digestibility of feed for 1% makes it possible to increase daily milk yield per cow on average 250 g hardest body cattle

digest cellulose. [1] Reaching high digestibility fiber can be an additional source of energy to produce milk with the same food, which otherwise is simply out of the transit of animals [1]. Also, the cost of livestock