

**METHODS FOR DETERMINING THE STABILITY OF MACHINE UNITS**

Zakharov S.S. - master's student of BSTU, Si Yuan, - 2nd year, Qingdao University of China, Artiomov M - Doctor of Technical Sciences, Professor

*Проблеми забезпечення стійкості руху є особливою турботою науковців і сільгосптоваровиробників. Розглянуто метод визначення і забезпечення якісного виконання технологічного процесу.*

The conditions and principles of completing MSAs that are part of a particular machine system depend on the design parameters and dynamic properties of the machines that make up the unit. Completed agricultural units in operation must ensure dynamic stability and controllability during agricultural operations and meet the requirements of the following evaluation indicators: agrotechnical, operational, industrial, economic, general technical and aesthetic and ergonomic

Currently, methods for assessing the dynamics of mobile machines based on the use of inertia sensors or accelerometers have been developed. However, in order to obtain complete and reliable information, it is necessary to justify the minimum possible number of measuring axes of accelerometers and rational points of their installation [1]. The number of independent input (driving) links affects the response of the output link and determines the number of degrees of mobility of a mobile machine or mechanism.

In mobile agricultural units, external links are most often non-holonomic. Therefore, if  $n_q$  - is the number of independent generalised coordinates, then the degree of freedom of the system affected by external non-holonomic links -  $S_{H\text{ зовн}}$  can be written in the form of the equation

$$H = n_q - S_{H\text{ зовн}} + q_{H\text{ зовн}}$$

When an MSA moves, the steering, braking system and engine with transmission provide a change in the parameters of rotational motion, in addition, the engine-transmission system can be used to create different traction forces (different angular speeds of rotation of the wheels of different sides) [2].

Under the influence of disturbing forces acting on the tillage tool, the unit moves along a certain sinusoidal trajectory with constant turns. This is the most general case of implementing all degrees of mobility of a mobile machine. The time of a simple manoeuvre includes the control signal delay time, the control signal rise time from zero to the maximum value, and the steady-state movement time during the manoeuvre.

**References**

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