

## **SUBSTANTIATION OF THE SCHEME AND PARAMETERS WIDE SPAN VEHICLE**

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*Summary: The article is devoted to the problems of the aggregation wide span vehicle. The plane-parallel movement of the wide span vehicle in the horizontal and vertical planes is investigated.*

*Keywords: controlled traffic farming, wide span tractor-based machine, theoretical research.*

Recently, wide span vehicle have become increasingly popular in the world [1]. They allow you to implement technology-driven movement of mechanization on the field. Their development corresponds to the vector of scientific and technological progress directly in the direction of automation and robotization of agricultural production.

To ensure high versatility, wide span vehicle (or vehicles with a wide gauge of their wheels) should be completed with various trailed, semi-mounted and mounted agricultural machines and implements [2]. The effect of compaction on the ground of their undercarriage systems in the fertile (agrotechnical) zone of the field, as well as traction properties, stability and controllability of the movement of the wide span vehicle is largely determined by the scheme of their connection and the parameters of the rear linkage.

Due to the weight and traction resistance of agricultural implements, the vertical loads on the wheels of a wide span vehicle can vary significantly. The main problem is that improper attachment of agricultural machinery and implements to the tractor increases the vertical load on their support wheels. Which are placed, as a rule, in an agrotechnical (fertile) zone of the field. Because of this, as a result of the excessive sealing effect of working machine systems on the soil, the entire effect of controlled movement in agriculture can be reduced to zero. Therefore, the question of studying the effect of the parameters of the rear hitch of a wide span vehicle on the nature of changes in vertical loads on its wheels is relevant.

The aim of the study is to increase the traction properties, stability and controllability of the movement of the wide span vehicle and reduce the sealing effect of the running systems of the machinery on the soil in the fertile zone of the field, by justifying the parameters of their mounted devices and the mounting scheme of agricultural machines and attachments to them. Theoretical studies, the synthesis of structural diagrams and parameters of a wide span vehicle were carried out by simulating its working conditions on a PC. Research methods are based on the basic principles of theoretical mechanics and the theory of tractors

using the Mathcad package. The physical object of the research was the wide span vehicle designed by Tavrichesky State Agrotechnological University (TSAU), Ukraine [3] (Fig. 1).



Fig. 1. Wide span vehicle design of the Tavria State Agrotechnological University (TSAU)

### Conclusion

As a result of the research, it has been established that apart from the inclination angles of the rear-mounted linkage wide span tractor (vehicle), such design parameters as the distance from the attachment to the center of resistance and the support wheel of the agricultural machine or implement have a significant effect on the redistribution of normal reactions on its front and rear wheels.

Adjustment of the three-link rear-mounted linkage wide span tractor (vehicle) with a large positive angle of inclination of the central rod (reaching 40 deg. and above) and a negative angle of inclination of the lower links is possible only after a detailed study of the kinematics of its operation, which may serve as the basis for further research.

With the purpose of almost completely eliminating the sealing effect on the soil of the running systems of machines in the fertile (agrotechnical) zone of the field, it is recommended to use regulators on wide span tractors (vehicles) to correct the normal vertical load on the support wheels of an agricultural machine or implement that work according to the principle of known traction tractors.

In most possible options for setting up a rear-mounted linkage wide span tractor (vehicle) we have unloading its front wheels. To increase and, consequently, maintain the residual controllability of the wide span tractor (vehicle) under the kinematic method of its control, it is expedient to place all possible technological capacities closer to the front axis of its wheels. Thus, increasing the vertical load on them by adding weight from the process container to the material.

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### **ПНЕВМОРЕШІТНИЙ СЕПАРАТОР СКАЛЬПЕРАТОРНОГО ТИПУ ІЗ ЗАМКНЕНОЮ ПОВІТРЯНОЮ СИСТЕМОЮ**

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*Summary: The pneumatic separator of a scalper-type with a closed air system will, according to the similarity principle, develop pneumatic separators of modular type with the productivity of 10 ... 50 t/h.*

*Keywords: pneumatic separator of a scalper-type, closed air system.*

Запропоновано удосконалення технологічної схеми пневморешітного сепаратора (ПРС) скальператорного типу зі замкнутою повітряною системою (рис.1), в якому шляхом установки пневмосепаруючої і осадової камер зі складною геометричною поверхнею, з'єднаних всмоктувальним каналом з діаметральним вентилятором, що створює замкнуту повітряну систему, забезпечуються поліпшення процесу виділення легких домішок, зменшення енергоємності пневмосепарації та забрудненості навколишнього середовища.

Основними елементами ПРС є: вентилятор діаметральний 1; жалюзійний повітрярозподільник 2; лоток-інтенсифікатор 3; бункер 4; пневмосепаруюча камера 5; решето циліндричне 6; очисник щітковий 7; 2-х ступенева осадова камера 8; всмоктувальний канал вентилятора 9.

Технологічний процес роботи ПРС здійснюється наступним чином. Повітряний потік від діаметрального вентилятора 1 направляється до повітрярозподільника 2 та лотка-інтенсифікатора 3. Зерновий матеріал із бункера 4 надходить до лотка-інтенсифікатора 3, на якому забезпечується регулювання інтенсивності псевдозрідженого шару зернового вороху. Тут здійснюється сегрегація – зерно, як більш важка фракція, опускається в нижній шар, а легкі домішки – в верхній шар. За рахунок обертання циліндричного решета 6, зерно проходить крізь решето і виводиться з ПРС.