

Development of control concepts for improved driving dynamics of harvesting machines with large headers

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Abstrak

This book examines the driving dynamics of harvesting machines with large harvesting heads. It looks at how to efficiently use these machines. The author explores a common problem that hinders machine performance when harvesting with very large headers. He deals with concepts for reducing the undesired effects of vehicle dynamics when using these machines.

With the steadily increasing capacity of harvesting machines, the working widths of the harvesting heads get wider and the headers get heavier. It has become essential with these giant headers to use header height sensors and header control systems to avoid the headers from being run into the ground when encountering elevation changes in the terrain. A fundamental limitation of the viable speed of header height adjustments arises from the combination of the wider and heavier headers with soft agricultural tires.

The current solution to find an appropriate speed of header height adjustments is to perform a header calibration whenever a new header is attached to the machine and to endow the machine operator with the capability to tweak the speed of adjustments manually. The result of an inappropriate speed of height adjustments is a reduction in overall productivity and an under-utilization of the harvesting machine. The author looks at ways to prevent this. He offers detailed modeling of the vertical dynamics including dynamic wheel loads. In addition, the book contains results from simulations and machine tests.