

Improvement of sugarcane harvesting on sloping land by using a crawler cane harvester to extend the harvest period in rainy and dry seasons

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Abstract

Soil contact pressure by in-field machinery often causes compaction and reduces access to fields when soil moisture content is high.

A sugarcane harvester was therefore developed with low soil contact pressure. Testing in 2015 resulted in the following performance characteristics: a soil contact pressure of 43 kPa; an ability to operate at tilting angles over 25 degrees; measured yield losses below 10%; trash content below 13%; harvest weight 20 tons/hr; cutting length about 25cm, fuel consumption of 1.3 l/t; minimum rotational radius of about 5.6 m; and headland rotation time of about 60 sec. It has been in use since 2017.

The harvester was used on sandy soil in northeast Thailand and assessed in fields that yielded approximate 60 t/ha to 100 t/ha, including highly lodging cane. Harvesting was stable and its performance parameters (compared with those of existing medium-size models as shown in brackets) were as follows: 20 tonnes/hr (20 tonnes/hr) on average, yield loss ratio 8% (7%), trash ratio 8% (10% to 16%), cutting length 25 cm (20 cm), fuel consumption 1.3 l/tonne (2 l/tonne, headland rotation time 60 sec (90 sec).

It was also found that the new harvester is also less subject to tumbling in fields on sloping ground, is easy to handle in fields with irregular shapes or small upland fields, and is able to harvest high-yielding sugarcane and/or crops that are prone to lodging.

We concluded that the newly developed harvester is a useful option in northeast Thailand and may be suitable for many other areas that have similar characteristics/conditions.

KEYWORDS: sugarcane, harvesting, mechanization, sloping land, extend the harvest season