



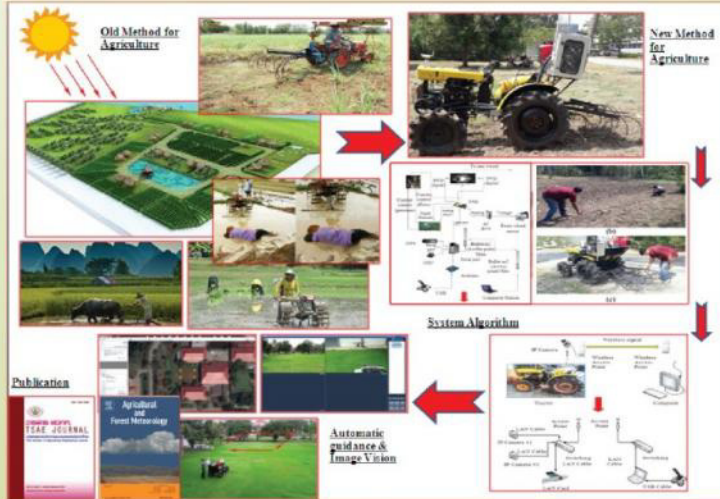
Development of an unmanned autonomous tractor using GPS guidance for modern agriculture



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Productivity Feature



According to the study was found that the field test system is designed to control the movement for autonomous tractor based on GPS guidance and intelligent unmanned controlling system for modern farming, a tractor moves along a linear path with straight lines and curves. The motion control systems were designed to control the tractor's moving along the path but while the tractors tracing the trajectory of a straight line at a constant speed during the tractors are mistakes of a relatively stable position that mean the controls are also present limitations. It was also found that the ability to work at 0.572 ha hr⁻¹ at the speed of 0.9 km hr⁻¹ and 1,440 hr year⁻¹ will be able to return if the plow to the area of 263.36 ha by tractors. Drawbar force was 15,168 N at the working speed of 0.25 m s⁻¹. Performance 85.30% rate of fuel consumption of 3.99 Liters hr⁻¹ with a slip value (% Slip) 47.4 with a drawbar power at 3.792 kW and the ability to work on 0.572 ha hr⁻¹, respectively.

agriculture **IP Status & Journal Paper** Agricultural and Forest Meteorology

Patent Number: 1603001821

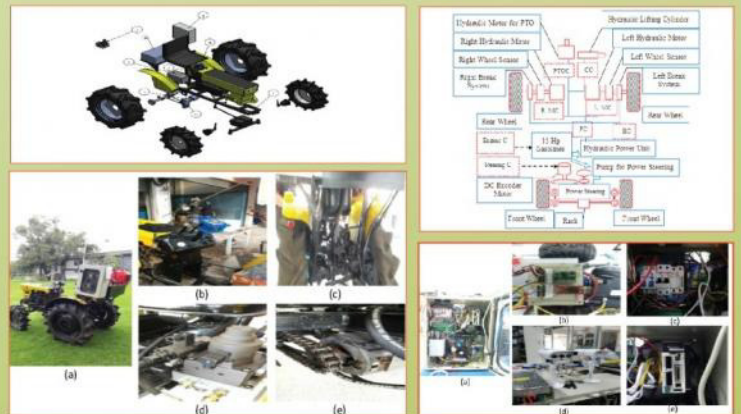
Grianggai Samseemoung, Manusak Janthong, Krawee Treeamnuak and Wicha Upaphai. Development of an unmanned autonomous tractor using GPS guidance for modern agriculture, Journal of agricultural engineering Association of Thailand, 2017; 23(1): 39-54.



Innovation & Creativity

An unmanned autonomous tractor with GPS navigation system for modern farming was powered by two rear wheels. This system was the gasoline engine size 15 Hp to drive the hydraulics pump. Driving system was controlled by the hydraulics pressure and its flow rate with hydro-static type. The whole system can work between fully automatic and remote control. The benefits are power for agricultural system such as primary soil tillage for plantation preparation, cultivated maintenance and harvesting for modern farming.

This unmanned autonomous tractor with GPS guidance system for modern agriculture is targeting in four key areas; Energy efficiency, Production, Machine performance and Emission-free production (Variable Rate Technology, VRT).



Applications



This research was moved to commercial scale with varies agricultural products including;

1. Oil palm plantations/Working capacity 0.57 ha/hr at pressure 1.5 bar and volume flow rate 2.712 Liters/minute/Labor cost decreased by 150,000 THB/yr with application of the sprayer mounted an unmanned autonomous tractor using GPS guidance.

2. Rice crop plantations/Working capacity 0.57 ha/hr at pressure 1.5 bar and volume flow rate 2.712 liter/minute /Labor cost decreased by 200,000 THB/yr with application of the sprayer mounted an unmanned autonomous tractor using GPS guidance.

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