

The performance of organic agriculture can be improved by controlling weeds with treading

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Although Verena Seufert and Navin Ramankutty mentioned the difficulty of weed controls in organic agriculture (1)(2), there is a new method for weed controls for rice. Without herbicides/genetic-driving-technology, an inexpensive method of organic agriculture for controlling the weed is "treading pressure" like animals' paths. We have examined the treading pressure method to the slope surface of rice fields in Japan from April to June in 2016 during the period with warmer weather. The weeds were growing rapidly in 2016.

We prepared two gardening carts of 8kg, on one of which we put a load of 20kg. We rolled the gardening carts down the slope every day or a week. Four test patterns are as follows: a) additional load 0kg & daily b) additional load 0kg & a week, c) additional load 20kg & daily, d) additional load 20kg a week.

The result showed that all patterns did suppress the weed growth, even pattern b) worked. Furthermore, the vegetation was changed from rice grasses competitor for rice into low plants, clovers, etc. So even after this experiment in June, we did not need any weed controls. It leads farmers to reduce their time and labor costs for the war to weeds and the environment to be clean.

However, we don't want farmers to keep treading around the field. The monotonous work is good for robots for 24 hours automatically with battery & RTK-GPS.

References

(1) Verena Seufert and Navin Ramankutty, Many shades of gray—The context-dependent performance of organic agriculture, *Science Advances* 10 Mar 2017: Vol. 3, no. 3, e1602638

(2) S. Delmotte, P. Tiftonell, J.-C. Mouret, R. Hammond, S. Lopez-Ridaura, On farm assessment of rice yield variability and productivity gaps between organic and conventional cropping systems under Mediterranean climate. *Eur. J. Agron.* 35, 223–236 (2011)