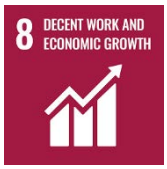
BRAIN

[Episode 2] Remote-controllable grass mower

Outcome Example of Bio-oriented Technology **Issued on March 16, 2020**

Research Advancement Institution



[Reducing the heavy workload of mowing]

Please do not make light of mowing. Mowing the areas in the vicinity of agricultural fields are necessary for controlling the damage by insect pests and securing farm roads.

At present, the elderly persons aged >65 account for 98% of 1.4 million core persons mainly engaged in farming (independent farmers) (Source: Statistics Department, Minister's Secretariat, Ministry of Agriculture, Forestry and Fisheries 2019). Mowing is a heavier workload for elderly persons than you anticipate. To revitalize the Japanese agricultural industry, a safe and efficient mowing method is required.

In this situation, the “Remote-controllable mower” developed by Sanyo Kiki Co., Ltd. (Satosho-cho, Okayama) (Lower left photo; supplied by Sanyo Kiki) is a big success.

A commonly used mower is a bush cutter, by which the user mows grass manually using rotary teeth attached to the tip of a long arm. However, this type of mower has a severe problem that a heavy burden is placed on the user because the user’s body vibrates during mowing because of thumbing vibration and noisy sound. Moreover, the bush cutter always carries a risk that the user may injure the leg when slipping or falling because they lose their balance on a steep gradient or slope difficult to operate.

[Safe, efficient, and easy to operate]

A remote-controlled operation may eliminate this concern. The remote-controlled mower may be remotely operated even at the place 200 m away from the mowing site, thus eliminating the requirement for concern about such a risk. Moreover, the user may mow the grass on the steep gradient at the max inclination of 40 degrees using the remote mower. Furthermore, using this mower capable of moving freely forward and backward, the user may mow grass easily even on a ridge between fields and river bank where it is difficult to move, in a space difficult for the user to enter, and a long slope at a roadside. The mower capable of mowing grass at high speed requires only about 30 min to mow the grass on a slope of about 300 m^2 depending on the sites.

Remote-controlled mower working on a steep gradient

Farmers attempting to remotely operate the mower

The mower is very useful because it is capable of mowing the grass in the area under a solar panel difficult for the user to enter, in addition to agricultural fields. In short, it provides three features; “safe for the operator,” “high work efficiency,” and “easy to operate.”

[Demonstration in the seminar held by the academic society]

The demonstration of the mower has been conducted many times. The mower was demonstrated at an opening seminar entitled “Thinking about the future of agriculture in mountainous regions from the view of a smart operation of mowing” in August 2019 (sponsored by the Consortium for the Demonstration of Smart Farming in Mid-hills and Mountainous Paddy Fields). The demonstration was held at the “Agricultural machinery safety training class” by JA Ceresa on January 15, 2020, in Kawasaki, Kanagawa. Farmers tried to operate the mower (image on the right). The participants said, “we first encountered such a useful mower! It’s very attractive.” As is obvious, the mower garnered good reviews.

The remote-controlled mower was developed using research funds granted by the Bio-oriented Technology Research Advancement Institution and placed on the market in April 2018. The mower has a weight of 200 kg (total length, 126 cm; width, 117 cm; height, 68 cm), and the price is 1,529,550 yen (suggested retail price, tax-included). More than 50 mowers are actively used in prefectures throughout Japan, including Hokkaido, Miyagi, Nagano, Mie, Okayama, Tottori, Hiroshima, Tokushima, and Fukuoka.

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<Project name> The special scheme project on advanced research and development for next-generation technology (commercialization promotion)
<Title> Commercialization of an autonomous moving mower using a small-sized engine
<Project period> FY 2014 to 2016
<Project research institute> Sanyo Kiki Co., Ltd. (Satosho-cho, Okayama)