

パルス高電圧による原木シイタケ子実体の増収と早期化における影響
Effect of high voltage pulse application on Shiitake (*Lentinus edodes*) mushroom logs on the production yield and harvest time

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Introduction

Outbreak of mushrooms around a lightning strike point has been reported by some farmers, forestry workers[1]. In the present experiment, two types of power sources were used to generate high voltage pulse to clarify the influence of electric parameters on the promotion of mushroom production. In this study, the influence of an application of high voltage pulsed to Shiitake (*Lentinus edodes*) mushroom logs on the fruit body yield were investigated. Two types of pulsed generator, Cockcroft-Walton circuit (CWC) and Marx generator, are used for evaluating the influence of the pulse width on the production.

Experimental setup

Fig 1 shows experimental setup for pulsed voltage stimulation to the *L. edodes* logs. In this experiment, *L. edodes* logs were placed on an insulator of acrylic. The electrode plate was installed at both ends of logs. The pulsed voltage was applied to the *L. edodes* log before harvest of first flush in autumn season. The pulse voltages were applied to *L. edodes* logs with a length of 0.9 m and a diameter of about 0.1 m. The total input energy into the logs was controlled by amplitude of and number of the apply voltage. In the case of Marx generator with the equivalent total capacitance of 55 nF, the high voltage pulses with maximum voltage of 30 kV and 50 kV were applied to the cultivation log for 5 times, and the total input energy were 127 J and 345 J, respectively. In the case of the pulsed power generator (Green techno, GM100) based on (CWC) with the equivalent total capacitance of 130 pF, high voltage pulses with maximum voltage of 30 kV and 50 kV were applied for 500 times, and the total input energy were 60 J and 148 J, respectively.

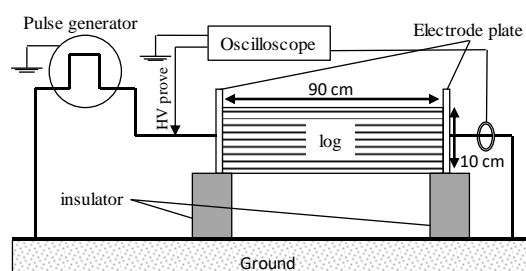


Fig. 1 Experimental setup for pulsed voltage stimulation to the *L. edodes* logs.

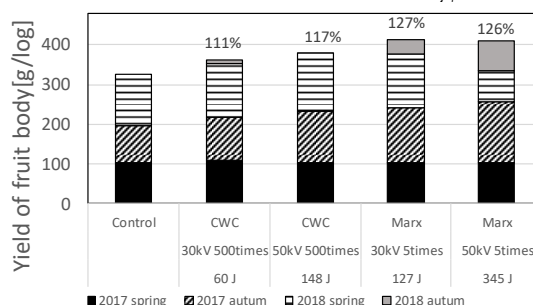


Fig. 2 Average yield of fruit body of *L. edodes* per a log for 4 flushes.

Results

Fig 2 shows the average weight of fruit body cropped per a log, cropped for 4 seasons. Since the logs are divided into 5 groups stimulated groups after 1st flush, the amount of the weight of fruit body is almost same. The average weight of fruit body is improved by applying pulse voltages and increased with increasing total input energy into the log. The average weight of fruit body in the case of the Marx generator is approximately 1.3 times higher than that in the control group. The results show that the improvement of the fruit body yield mainly depends on the total input energy into the log.

References

- [1] S. Ohga, Journal of Forest Research, vol. 6, (2001).