【抄 録】

題 名：ドローンの空撮画像を活用したコンニャク栽培圃場における倒伏株割合の推定

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要 旨

The possibility of detecting dead plant areas in konjac using an unmanned aerial vehicle (UAV) was investigated. The intensity spectrum of the dead plant area had a unique range. Aerial images were binarized to detect dead plant areas. The dead plant rate estimated from aerial images was compared with the dead plant rate observed. Therefore, there is a significant relationship between the actual dead plant rate and the rate from aerial images ($R2 = 0.829$, $p < 0.01$). This result proposes that the dead plant rate obtained from aerial images using UAV might allow us to predict the actual dead plant rate.

題 名：Potential of Myrobalan Plum as a New Pollinizer for Japanese Plum Cultivars

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要 旨

The aim of this study was to select new pollinizers for Prunus spp. with high pollen germination rates at low temperatures and assess their effect on the fruit set of Japanese plum cultivars. In this study, we examined in vitro pollen germination in 17 plum cultivars and two Myrobalan plum lines (420-2-2 and 421-3-1) at eight temperatures (7.5° C, 10.0° C, 12.5° C, 15.0° C, 17.5° C, 20.5° C, 22.5° C, and 25.0° C). The extent of pollen germination was affected by the incubation temperature. The germination rates of most cultivars were highest between 20.0° C to 25.0° C and ≤ 20% between 7.5° C to 10.0° C. However, the two Myrobalan plum lines (420-2-2 and 421-3-1) showed higher germination rates than the other cultivars at 10.0° C with ≥ 25% germination. The high germination rate in Myrobalan 420-2-2 was further confirmed in experiments conducted by our group in 2020. Open field studies on the Japanese plum ‘Kiyo’ revealed that the fruit setting rate was 17.6% using Myrobalan 420-2-2 and only 9.9% in the control using ‘Hollywood’. The fruit setting rate of the Japanese plum ‘Taiyo’ was approximately 20% when pollinated with both the cultivars. However, both fruit setting rate and fruit quality did not differ significantly between ‘Kiyo’ and ‘Taiyo’ with either pollination treatment. The formation rates of perfect seeds in ‘Taiyo’ were 90% and 65% by pollination using Myrobalan 420-2-2 and ‘Hollywood’, respectively. However, pollination treatment using pollen from both cultivars did not show any variations in the early development of the ovary and ovule. S-genotyping in Myrobalan 420-2-2 was determined as S7S10; therefore, we assumed that Myrobalan could be cross-compatible with many other plum cultivars. In conclusion, we selected Myrobalan 420-2-2 as a new plum pollinizer as it can effectively pollinate Japanese plum and germinate at low temperatures with no adverse effect on fruit set and quality.