論文審査の要旨
Summary of Dissertation Review

博士の専攻分野の名称 Degree	博　士　（農学）	氏名 Author	FAN XINYAN （範　心硯）
学位授与の要件	学位規則第４条第①・2項該当		

論　文　題　目　　Title of Dissertation

Application of Multiscale Remote Sensing and Simulation Modeling for Precision Forage Crop Management

論文審査担当者　　Dissertation Committee Member

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The study of this applicant focus on the technical developments, including both tool applications placed at multi-platform and forage growth simulation modeling, to optimize field-level management on the concept of being cost-effective, ease-of-use and delivering farms forage crop information accurately and quickly. With regard to applications of remote sensing tools, this thesis investigated image based remote sensing by developing two camera monitoring systems, consisting of normal red-green-blue (RGB) and visible and near-infrared (V-NIR) camera systems.

The research observed that the simulated yields were in statistical agreements with the corresponding measurements in the fields 1st and 2nd, with absolute errors lower than 4% and 12% for two seasons, respectively. However, forge yield of the field 3rd was seriously underestimated (34.69%) due to the specular reflection effects, suggesting that further improvements on image processing and operations of UAV trails need to be made in the future. In general, the methodology developed in this research to estimate forage growth and yield using GRAMI model and multiscale remote sensing, demonstrates reliable estimation abilities and appears to be applicable for predicting forage yields with a reasonable degree of accuracy.

The presented thesis is the first basis, highlighting the possibilities of integrating image-based multiscale remote sensing and simulation modeling technique to assist precision forage crop management at field scale. It is expected that the suggested approaches can lead to an improvement of the predictive accuracy in the context of biophysical parameter retrieval and be utilized in practice with cost-effective and really easy-to-use manners.

The examined committee agreed that the applicant is fully qualified to be awarded the degree of Doctor of Agriculture.