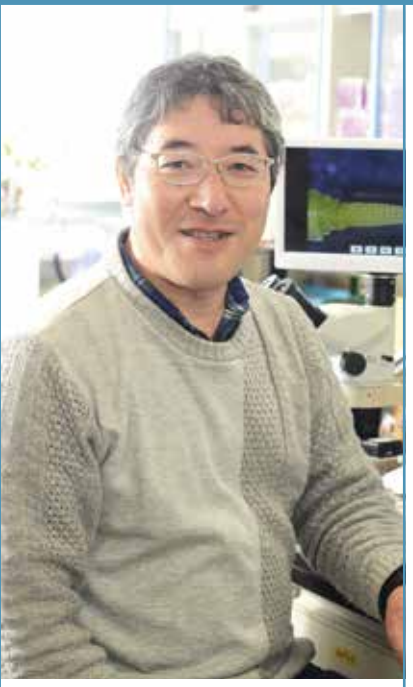

Assoc. Prof.
NISHIDA Hidetaka

Genetic study on instability of flowering time in wheat and barley under global warming conditions

Global climate change has a huge impact on crop production. For wheat and barley production in Japan, warm winter has been arising as a serious problem which would cause yield decrease and low quality.

So far, early-flowering (heading) varieties of wheat and barley have been developed to avoid pre-harvest sprouting and Fusarium head blight, which could often be caused by monsoonal rain during maturing and harvesting stages. However, most of early-flowering varieties show “instability of flowering time” in response to ambient temperature. They differentiate young spike primordium extremely earlier in warmer winter than in ordinary years. Unexpectedly precocious spike development will result in yield decrease due to less biomass production and frost injury caused by transient chills in early spring.

To solve the problem, it is necessary to disclose genetic mechanism underlying the instability of flowering time. For this goal, we are working on (1) identification of novel flowering-time genes and their interaction with other flowering-time genes, (2) finding genes which do not promote flowering very much even under warm winter condition, and (3) disclosing the genetic mechanism underlying the instability of flowering through molecular genetic study.