

Studies on the onion yield variation under recent unstable climate in Hokkaido

(北海道における近年の不安定気象とタマネギの収量変動に関する研究)

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Abstract

1. Factor analysis of yield variation in recent years

The onion is one of the most representative vegetable cultivated in Hokkaido. The share of Hokkaido in onion shipment amount in 2016 is about 75% of Japan according to the statistics collected by Ministry of Agricultural, Forestry and Fisheries (MAFF) of Japan. However, the yield is markedly unstable in recent years since 2009. The coefficient of variation in the onion yield in Kitami, Furano, Iwamizawa, main production area in Hokkaido, showed 0.11, 0.12, 0.18 respectively from 2000 to 2016. To clarify the factors concerned with yield variation, data of meteorological condition was checked on the yield of onions in growing season in Hokkaido. It turns out that excessive rainfall and high frequency of atmospheric precipitation in onion's planting season (4.20-5.20).

2. Trial of set cultivation for overcoming the unstable climate

Seedlings are usually planted into the field in ordinary system. While onion sets, small bulbs with approximately 20 mm in diameter, have been planted in some North Europe. Set cultivation was evaluated as new system for overcoming unstable climate in spring. This study evaluated the effect of soil moisture on onion (cv. Kitamomiji 2000) growth using two types of onion, seedlings and plants emerged from the set. Both onion types were cultivated in Wagner pots with 3 ranges of soil moisture based on pF values, 1.6(wet), 2.0(medium) and 2.4(dry). Onion plants emerged from sets increased number of expanded leaves, leaf length and bulb weight in every pF value as compared to seedlings. However, their leaf growth in dry soil (pF 2.4) was smaller than those in the soil with pF 2.0 and pF 1.6 in set cultivation. Set is an alternative nursery for establishment of early growth in onion.

3. Investigation in Furano

Simultaneously, research on Furano onion field was also conducted in 2017. Negative relationship was recognized between onion yield and accumulated temperature in Furano. From the observation of onion growth in Furano in 2017, continuous high temperature in July, before the lodging, led the yield reduction because of valley location surrounded by the mountains. There is no doubt that onion yield variation has regional characteristics.