水稻品種の冷害抵抗性及び其の検定方法に關する研究*

(VIII) 晩播晩植による低温障害並に稻熱病發生の品種間差異

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A study of the resistabilities of paddy rice varieties to unseasonable low temperatures and the methods of their determination (VIII) Inter varietal differences in the injury caused by low temperature and the blast disease due to late seeding and transplanting. Y. Kondo and K. Igarashi.

晩播晩植による低温障害としての不稔粒發生は、1943 年のごとき全生育期間が多照高温の場合には少なく、したがって品種間差異も表現されないが、1942 年のごとき生育期の氣象が良好でなく幼穂發育期から開花授粉期にわたつてしばしば異常低温が襲來する場合には不稔粒歩合が増大してその品種間差異がやや顯著に表現される。かく稔實障害に品種間差異が發現する原因は、主として、品種の低温抵抗性及び晩播晩植による生理機能低下度の差異並に生殖細胞形成期乃至開花授粉期と異常低温との廻り合せの關係等による。しかし、かかる關係を検討して供試品種についてその耐冷性の分級を行つた。

晩播晩植においては低温による登熟障害に品種間差異がおこるが、これによつて品種の耐冷性乃至登熟作用に關する低温抵抗性の差異を検知することは困難である。

晩播晩植に伴ふ播種より出穂迄日數の短縮度の品種間差異は、生理機能低下度の大小を伴ふものと考へられ、したがつてかかる意味において低温障害に關連をもち、出穂期の遅延度の品種間差異は、生育後期において異常低温に遭遇する機機會の多少を結果することによつて、低温障害の程度に影響を及ぼすことになる。

晩播晩植による 1 株穗數の減少は、通常の場合には、低温障害によるものではない。また、1 穗總粒數は、その變化が概して少なく、その減少率の品種間差異も認めにくい。

水稻品種の耐冷性の検定方法として、かかる晩播晩植法は、多數の材料を同時に供試できる利點はあるが、これは寒冷地において、しかも特定の生育時期に異常低温が襲來する年次でなくては適用できず、さらに試験操作及び成績判定にも多大の勞作と煩雜を伴うから、一般の場合には、適當さは認められない。

なほ、晩播晩植に伴ふ稻熱病罹病穗數歩合に基き、供試品種につき耐病性の分級を行つた。しかして、水稻品種における耐冷性と耐病性とはそれぞれ別箇の遺傳要素が關與するものと推考された。

Résumé

The occurrence of sterile spikelets as an injury by low temperature due to late seeding and transplanting is insignificant in a year like 1943 when abundant sunshine and high temperature prevailed during the whole growing period, and consequently no inter-varietal difference shows itself, but in a year like 1942 when the climatic conditions during the growing period were unfavorable with frequent visits of abnormal low temperature at the stage of ear formation and flowering, the per-centage of sterile spikelets increases and inter-varietal differences show themselves somewhat notably.

This manifestation of inter-varietal differences in injury to fertilization is chiefly attributable to

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the differences in the varietal resistability to low temperature and the degree of decline of the physiological function due to late seeding and transplanting, chance concurrences of the stage of formation of generative cells or the stage of flowering and pollination with abnormal low temperature, and other relations. By inquiring into such relations, we classified the insensibilities to cold of the varieties used in our experiment.

In late seeding and transplanting, inter-varietal differences arise in the injury to fructification due to low temperature, but it is difficult to detect therefrom differences in the resistability to low temperature or in the insensibility to cold of a variety.

Inter-varietal differences in the degree of reduction of the number of days from seeding to earing attendant upon late seeding and transplanting is thought to be accompanied with differences in the degree of decline of the physiological function, and therefore is, in this sense, related to the injury by low temperature. Inter-varietal differences in the delay of earing exercise an influence upon the degree of injury by low temperature by causing more or less chances of meeting with an unseasonable low temperature at the stage of ear formation or flowering.

Decrease in the number of ears per hill (individual) is, in ordinary cases, not due to injury by low temperature. The total number of spikelets per ear generally shows little change, and inter-varietal differences in the rate of its decrease are hard to detect.

As a method of determining the insensibility of a paddy rice variety to cold, late seeding and transplanting has the advantage that a number of materials can be used in experiment at the same time, but this method can be employed only in cold regions, and that in a year when unseasonable low temperatures attack during the specific growing period. Moreover, it involves much labor and trouble in the conduct of an experiment and judgement of its results, and therefore cannot be considered as appropriate for general purposes.

We have also made a classification of the insensibilities to disease of the varieties used in our experiment on the basis of the per-centages of ears affected by blast as the result of late seeding and transplanting, and we can infer that different genetic factors take part in the insensibilities of a paddy rice variety to cold and to disease.