Chlorophyll Fluorescent Light Kinetics Parameters to Main Cotton Varieties in North Xinjiang

TANG Zhao-yun[1], WAN Guo-qiang[2], LIU Tong[1], WANG Zhi-yong[2]

(1. *Biological Engineering College, Shihezi University, Shihezi, Xinjiang* 832003, *China*;
2. *College of Agriculture, Shihezi University, Shihezi, Xinjiang* 832003, *China*;)

Abstract: The experiments were carried out during 2000—2002 to classify photosynthesis, on the basis of testing on different levels of photosynthesis, for forming a complete study on improved varieties and good methods tapping the latent power for high yields of breeds and realizing high and power for high yields. This research determined PSII Fv/Fm, F/Fm′ and qN are decreasing within 40 days. After 40 days Fv/Fm and F/Fm′ are decreasing, but Fo and qN are increasing. At 8 o'clock am and 6 o'clock pm the difference of PSII Fv/Fm among all kinds of breeds is minibus, with the increasing of light's intensity. The value is the lowest at 14 o'clock, then begins to increase, however, the change of qN is contrary. The PSII Fv/Fm and qP of XinLuZao 6 (XLZ-6), XLZ-8, XLZ-10 are higher than those of XLZ-4, XLZ-1, XLZ-7. But the qN of former is lower than the later. Indicating the former possesses higher absorbing and transforming capability of light. Pn and chlorophyll fluorescent light parameters of cotton leaf development period in main cotton varieties in north Xinjiang. The light intensity increases Fv/Fm of the cotton leaf descends in sunny day, at 14:00 Fv/Fm descends to the minimum. Afterwards, as the light intensity descends, Fv/Fm increases, but qN is on the contrary. Cotton leaf is easy to occur light inhibition and will evoke emotion destructive reaction in middle of reflection. The result of the test indicated that, under the strong light and high temperature, the cotton blade appears and shuts the phenomenon of noon recess. In the time shutting the low ebb in the light, the factor not relative to air vent becomes the important reason why the light reduces jointly. The light happening under a kind of conditions is suppressed, its mechanism may not be the radiation energy dissipation. Shut organization destroy slightly, and repair quickly after illumination subsiding only, because Fv/Fm has already totally resumed to pm 6 o'clock. Though temperature change have certain influence to Fv/Fm at fine noon, strong light mag be the main reason for suppression only at noon.

Fv/Fm represents transformming efficiency on behalf of the original for the first time light energy of PSII. Relatively high ratio of Fv/Fm, prove and shut organ can have been at light energy relatively abundant and high-efficient transformmed into chemical energy. At PSII former the beginnings electron oxidize qP is a measure of the proportions of reaction center open parts, reflectting the electron that only shut the electronic chain and transmitting speed.

In brief, high yield varieties have high values of the Fv/Fm and qP. And Fv/Fm resumes comparatively fast after noon, have relatively strong attraction to the light energy, activition still with relatively high PSII and light energy transformming efficiency at the same time. Thus not probably at light energy effective chemical energy of turning into absorbed, It raises electron transmitting speed and forms more ATP and ENADPH shut carbon assimilate and offer abundant energy and reduce ability for light. Therefore can know, the high mere result characteristic demonstrated from the variety with relatively high output, it is physiologies biochemical foundation of the high yield of crop to fully prove the light energy that only shuts the organ and absorb, transmission and transformming efficiency.

For all of breed's characters of photosynthesis, LAI and Pn may be the targets of a meliorating in the future. PSII Fv/Fm and qN are the better targets. The rate of source and storehouse can be looked on as important targets of harmonious relation between source and storehouse of different breeds.

Key words: north Xingjiang; cotton; fluorescent light parameters