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Ecological effects of Triticale intercropping on young tea garden

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Key words : young tea garden, triticale, intercropping with different row interval, ecological effects

Introduction Research of intercropping grass forage into young tea garden was limited. This study focused on the ecological difference of triticale biological covering on young tea garden and the intercropping system effect on growth and development of triticale and young tea.

Materials and methods The site was on research station of Anhui Agricultural University (N31°51', E117°17'). AS5: 2 rows tea, 1 row triticale, 90cm space (2:1); AS4: 2 rows tea plants, 3 rows triticale, 60cm space (2:3); AS3: 2 rows tea plants, 5 rows triticale, 30cm space (2:5). Monoculture young tea AS1 and monoculture triticale AS2 as checks. Air temperature, underground soil temperature (0, 5, 10, 15cm) and illumination intensity was measured during early summer and overwintering. Triticale fresh and dry matter yield was measured in sprouting and shooting stage, respectively. The field growth rate of tea young shoot was determined and the days from shoot rudiment to shoot residence was recorded. Net photosynthetic rate (Pn) of Triticale flag leaf in flowering and of 30-days old tea leaf in April was determined. All data was analyzed with Microsoft excel 2003 and SPSS11.0.

Results It indicated that intercropping triticale in young tea garden could elevate daily mean air temperature, soil temperature and daily lowest temperature in overwintering stage. By contrary, intercropping compounds could decrease the highest air temperature and daily mean temperature (Figure 1, 2). It suggested that triticale bio-covering was favor young tea for overwintering or live through the summer. But Triticale might impeded young tea growth, tall Triticale plant intercepted and captured illumination and the illumination intensity arrived tea crown was decreased (Figure 3), which caused decreased Pn and tea growth (Figure 5, 7). But Pn of Triticale flag leaf on intercropped system was not decreased compared with AS2 (Figure 4), the fresh and dry matter yield of AS4 and AS5 was higher than check AS2 (Figure 6).

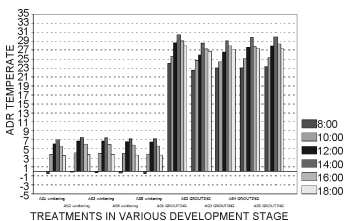


Figure 1 Air temperature variance in various treatments.

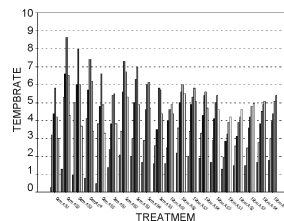


Figure 2 Underground Soil temperature various under various treatments.

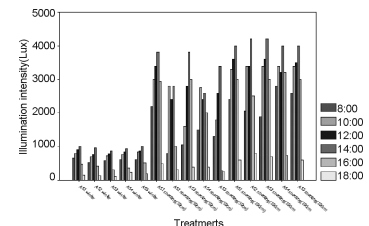
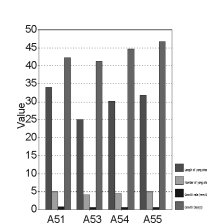
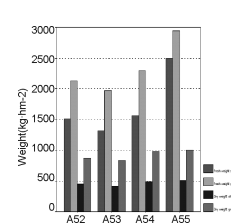
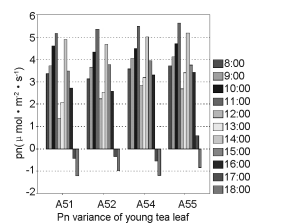
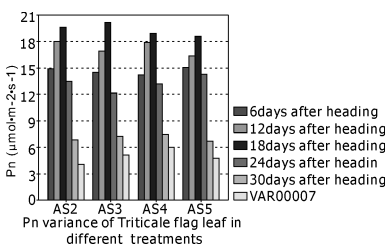


Figure 3 Illumination intensity in various treatments.



Conclusions This research indicated that intercropping 1 or 3 rows triticale in broad spacing could increase the coverage in tea garden thus was characterized by heat preservation and preventing frostbite which favor young tea overwintering. Besides, intercropping complex system produced high quality forage so enhance the development of animal husbandry.