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Effects of Nursery Temperature on the Growth of Rice Nurseling Seedlings Raised in Darkness

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Abstract:

Effects of nursery temperature (20, 25, 32 and 37°C) under dark conditions on the growth of the rice non-greening nurseling seedlings and growing process of the seedlings raised under dark and around optimum temperature for extremely short period (4 days) were studied. 1) The growth rate of seedlings is fastest under 32°C and it took only 3~3.5 days to raise the seedlings the a plant length (PL) of 7~8cm, which is required to plant normally using a rice transplanter, after seeding the sprouted seeds. In this case, the accumulated temperature for this period is about 100~110°C, less than those of other temperatures. The seedlings attained 7~8cm in PL had 2.0~2.1 in plant age in leaf number (PALN), 4~5mg top dry weight and ca. 50% remaining endosperm, irrespective of the temperature. 2) The results raised the seedlings for 96 hrs (4 days) undre dark and around optimum temperature (32°C) conditions showed that PALN and PL or seminal root length (SRL) increased unti1 72 and 96 hrs after seeding, respectively and attained 2.0~2.1 in PALN, 8~9cm in PL and about 7cm in SRL. On the other hand, the remaining percentage of endosperm was 75~80% just before the emergence of the 1st leaf (48 hrs after seeding), but it decreased linearly to ca. 40% after 96 hrs. Coleoptilar nodal roots (CNR), a1 and a2 emerged on both sides of seminal root (SR), and then b1 and b2 on the sides opposite the SR and finally root c between a1 and a2. Among these nodal roots, the emergence percentage of c was very low and that of b was variable depending on cultivars. The average number of CNRs was 3.0~4.1, and total length of these roots surpassed the SR length at around 80 hrs and reached 7~9cm by 96 hrs after seeding.

Keywords:

Coleoptilar nodal root, Growing process, Non-greening nurseling seedling, Nursery temperature, Remaining percentage of endosperm, Rice plant, Seedling length, Seminal root

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