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[doi:10.11861/j.issn.1000-9841.2009.06.1016]

FENG Ya-nan,LI Can,FENG Nai-jie,et al.Effects of Seed Soaking with Plant Growth Regulators (PGRs) on the Carbon Metabolism of Soybean Seedling Cotyledon[J].Soybean Science,2009,28(06):1016-1020.[doi:10.11861/j.issn.1000-9841.2009.06.1016]

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不同植物生长调节剂浸种对大豆幼苗子叶碳代谢的影响

《大豆科学》[ISSN:1000-9841/CN:23-1227/S] 卷:第28卷 期数:2009年06期 页码:1016-1020 栏

目:出版日期:2009-12-25

Title: Effects of Seed Soaking with Plant Growth Regulators (PGRs) on the Carbon Metabolism of Soybean Seedling Cotyledon

文章编号: 1000-9841(2009)06-1016-05

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关键词: 大豆; 植物生长调节剂; 子叶; 碳代谢

Keywords: Soybean; Plant growth regulators; Cotyledon; Carbon metabolism

分类号: S565.1

DOI: 10.11861/j.issn.1000-9841.2009.06.1016

文献标志码: A

摘要: 在砂培条件下,以清水浸种为对照(CK),以不同浓度己酸二乙氧基乙醇酯(DTA-6)和烯效唑(S-3307)浸种为处理,研究不同浓度的DTA-6和S-3307对苗期大豆子叶内可溶性糖、淀粉、蔗糖及还原糖含量的影响。结果表明:处理和对照的可溶性糖含量均呈升高-下降-升高的变化趋势,出苗后第6天DTA-6处理的可溶性糖含量低于S-3307处理和CK;淀粉含量呈先减少后增加的变化趋势,在出苗后第8天降到最低点,出苗后第10-12天子叶淀粉含量又有所增加,出苗后第12天DTA-6处理的淀粉含量低于CK和S-3307处理;子叶蔗糖的含量大致呈升高-降低-升高的趋势,S-3307处理的蔗糖含量普遍高于DTA-6处理;子叶还原糖含量在取样时间内出现了几次波动,其中苗后第8天左右减少到较低值,DTA-6普遍提高了还原糖含量,S-3307(S0.2除外)降低了取样后期的还原糖含量。综合分析表明:适宜浓度的植物生长调节剂浸种能够调控子叶的碳代谢,利于幼苗的健壮生长,2类调节剂中分别以D50和S0.2的调控效果最佳。

Abstract: The objective of this study was to compare the carbon metabolism of soybean seedling cotyledon treated with different plant growth regulators. Sand culture experiments were conducted on the trial farm of Heilongjiang August First Land Reclamation University (46.9° N 125.0° E) with soybean cultivar Kennong4 as material. The seeds were soaked with plant growth regulators Diethyl aminoethyl hexanoate (DTA-6), 25 (D25), 50 (D50) and 100 mg.L⁻¹ (D100); and Uniconazole (S-3307), 0.1 (S0.1), 0.2 (S0.2) and 0.4 mg.L⁻¹ (S0.4), with seed water soaking as comparison. Content of sugar, reducing sugar, soluble sugar and starch in soybean seedling cotyledon were determined every two days after emergence. During the seedling period, the soluble sugar content of all treatments showed increasing-decreasing-increasing trend, and soluble sugar content of DTA-6 was lower than the S-3307 and CK 6 days after emergence. Starch content showed decreasing-and-then-increasing trend, and reach its lowest point on the 8th day after emergence, on the 12th day after emergence, the starch content of DTA-6 was lower than the S-3307 and CK. Sucrose content was showed zigzag dynamic trend, and the sucrose content of S-3307 was higher than those of DTA-6 treatment. Reducing sugar content occurred several fluctuations within the sampling time, and reduced to a minimum on the 8th days after emergence. DTA-6 generally increased reducing sugar content, while S-3307 (S0.2 excepted) reduced the reducing sugar content in late sampling days. Results suggest that suitable dosage of plant growth regulator seed soaking can improve the activity of seedling cotyledon, promote carbon metabolism, and D50 and S0.2 treatments showed better regulation effects.

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备注/Memo: 基金项目: 国家科技支撑计划资助项目(2006BAD21B01); 黑龙江省“十一五”科技攻关资助项目(GA06B101-1-1); 国家教育部博士点基金联合资助项目(20070223002); 大庆市科技局资助项目(SGG2007-054); 黑龙江省农垦总局资助项目(NKKF07-4-3)。

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