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摘要: 以大豆品种南农99-6为材料, 通过盆栽试验研究了 α -萘乙酸对干旱和复水处理下大豆幼苗生长和光合作用的影响。结果表明: 干旱抑制了大豆的生长, 植株的生物量和叶面积的增长速率降低, 叶片相对含水量、叶绿素含量、净光合速率、气孔导度、胞间CO₂浓度和蒸腾速率等生理指标急剧下降。复水后大豆生长状况得到改善, 植株的生物量和叶面积的增长速率变大, 叶片相对含水量、叶绿素含量、净光合速率、气孔导度、胞间CO₂浓度和蒸腾速率迅速回升, 并在试验的最后阶段接近正常对照的水平。 α -萘乙酸预处理, 使干旱处理后大豆幼苗生物量和叶面积的增长速率下降变缓, 叶片相对含水量、叶绿素含量、光合参数等生理指标的降低幅度变小, 复水后加快了各项生理指标的恢复速度, 较干旱处理更快恢复到正常水平, 可见NAA能有效增强大豆幼苗的抗旱能力。

Abstract: Soybean (Glycine max var. Nannong99-6) was used to study the effects of α -naphthaleneacetic acid (NAA) on growth and photosynthetic characteristic of seedling under drought and re-watering with pot experiment. The results showed that drought inhibited the growth of soybean seedling. The increasing rate of biomass and leaf area decreased. Leaf relative water content, chlorophyll content, photosynthesis rate (Pn), stomata conductance to CO₂ (Gs), intercellular CO₂ concentration (Ci) and transpiration rate (Tr) all decreased sharply. After re-watering, the increasing rate of biomass and leaf area increased, chlorophyll content, leaf relative water content, Pn, Gs, Ci and Tr all increased rapidly and almost restored to the normal level at the final stage of experiment. Pre-treatment of NAA alleviated the decrease of the increasing rate of biomass and leaf area, leaf relative water content, chlorophyll content, Pn, Gs, Ci and Tr during drought stress time. And after re-watering, it also promoted the restore of soybean and increased physiological index as compared with drought treatment. It showed that NAA could effectively enhance the ability of drought resistance in soybean at seedling stage.

参考文献/References:

- [1]张立峰, 魏义章. 干旱缺水地区农业发展策略—高寒半干旱区农牧业持续发展理论与实践[M]. 北京:气象出版社, 2001. (Zhang L F, Wei Y Z. The agricultural development strategy of water-deficient area-sustainable development theory and practice of agriculture and husbandry in arctic-alpine semiarid area [M]. Beijing: Meteorology Press, 2001.)
[2]杨鹏辉, 李贵全, 郭丽, 等. 干旱胁迫对不同抗旱大豆品种花荚期膜透性的影响[J]. 干旱地区农业研究, 2003, 21(3): 127-129. (Yang P H, Li G Q, Guo L, et al. Effect of drought stress on plasma membrane permeability of soybean varieties during flowering-podding stage[J]. Agricultural Research in the Arid Areas, 2003, 21(3): 127-129.)

- [3]高蕾, 刘丽君, 董守坤, 等. 干旱胁迫对大豆幼苗叶片生理生化特性的影响[J]. 东北农业大学学报, 2009, 40(8): 1-4. (Gao L, Liu L J, Dong S K, et al. Effect of drought stress on physiological and biochemical characteristics in leaves of soybean seedlings[J]. Journal of Northeast Agricultural University, 2009, 40(8): 1-4.)
- [4]王磊, 胡楠, 张彤, 等. 干旱和复水对大豆(Glycine max)叶片光合及叶绿素荧光的影响[J]. 生态学报, 2007, 27(9): 3630-3636. (Wang L, Hu N, Zhang T, et al. Effects of drought and re-watering on photosynthesis and chlorophyll fluorescence of the soybean leaf[J]. Acta Ecologica Sinica, 2007, 27(9): 3630-3636.)
- [5]王磊, 张彤, 丁圣彦. 干旱和复水对大豆光合生理生态特性的影响[J]. 生态学报, 2006, 26(7): 2073-2078. (Wang L, Zhang T, Ding S Y. Effect of drought and re-watering on photosynthetic physioecological characteristics of soybean[J]. Acta Ecologica Sinica, 2006, 26(7): 2073-2078.)
- [6]张恒月, 郭屹立, 王磊, 等. 干旱和复水对大豆叶片光合生理特性及产量的影响[J]. 河南大学学报(自然科学版), 2009, 39(2): 183-188. (Zhang H Y, Guo Y L, Wang L, et al. Effect of drought and re-watering on leaf photosynthetic physiology characteristics and yield of soybean[J]. Journal of Henan University (Natural Science), 2009, 39(2): 183-188.)
- [7]Ohashi Y, Saneoka H, Fujita K. Effect of water stress on growth, photosynthesis and photo assimilate translocation in soybean and tropical pasture legume siratro[J]. Soil Science and Plant Nutrition, 2000, 46(2): 417-425.
- [8]山仑, 陈国良. 黄土高原旱地农业的理论与实践[M]. 北京: 科学出版社, 1993. (Shan L, Chen G L. The theory and practice of rainfed upland agriculture of loess Plateau[M]. Beijing: Science Press, 1993.)
- [9]Dolci M, Navissano G, Gay G, et al. Comparison among 18Hexyl Esters of 1-Naphthylacetic Acid used on Grapevine [J]. Journal of Agricultural and Food Chemistry, 1999, 47(4): 1767-1770.
- [10]Murillo Pulgarin J A, Fernandez Lopez P, Garcia Bermejo L F, et al. Fast kinetic determination of 1-Naphthylacetic acid in commercial formulations, soils and fruit samples using stopped-flow phosphorimetry[J]. Journal of Agricultural and Food Chemistry, 2003, 51(22): 6380-6385.
- [11]Streitwieser A, Husemann M, Kim J. Aggregation and reactivity of the Dilithium and Dicesium Enediolates of 1-Naphthylacetic Acid[J]. Journal of Organic Chemistry, 2003, 68(21): 7937-7942.
- [12]曲亚英, 郁继华, 陶兴林, 等. S3307和IBA+NAA浸种对低温胁迫下甜椒幼苗抗冷性的影响[J]. 甘肃农业大学学报, 2006, 41(4): 52-55. (Qu Y Y, Yu J H, Tao X L, et al. Effect of seed soaked with S3307 and IBA+NAA on cold resistance of sweet pepper seedlings[J]. Journal of Gansu Agricultural University, 2006, 41(4): 52-55.)
- [13]郑平生, 金芳, 燕丽萍. 几种外源激素对盐胁迫下草莓试管苗生长的影响[J]. 甘肃农业大学学报, 2004, 39(3): 277-280. (Zheng P S, Jin F, Yan L P. Effect of exogenous hormones on growth of strawberry test-tube plantlets in salt stress[J]. Journal of Gansu Agricultural University, 2004, 39(3): 277-280.)
- [14]李合生. 植物生理生化实验原理和技术[M]. 北京: 高等教育出版社, 2000. (Li H S. Principles and techniques of plant physiological biochemical experiment[M]. Beijing: Higher Education Press, 2000.)
- [15]白志英, 李存东, 孙红春. 干旱胁迫对小麦染色体代换系旗叶相对含水量和离子流失速率的影响[J]. 华北农学报, 2008, 23(1): 62-65. (Bai Z Y, Li C D, Sun H C. Effect of drought stress on relative water content and RWL of flag leaves in wheat chromosome substitution lines[J]. Acta Agriculturae Boreali-Sinica, 2008, 23(1): 62-65.)
- [16]赵祥, 侯志兵, 董宽虎, 等. 水分胁迫及复水对达乌里胡枝子酶促防御系统的影响[J]. 草地学报, 2010, 18(2): 199-204. (Zhao X, Hou Z B, Dong K H, et al. Effects of drought stress and rewating on enzymatic defensive system in Lespedeza davurica(Laxm.) Schindl. [J]. Acta Agrestia Sinica, 2010, 18(2): 199-204.)
- [17]石永红, 万里强, 刘建宁, 等. 干旱胁迫对6个坪用多年生黑麦草品种抗旱性的影响[J]. 草地学报, 2009, 17(1): 52-57. (Shi Y H, Wan L Q, Liu J N, et al. Effects of PEG stress on the drought resistance of six turfgrass varieties of Lolium perenneL. [J]. Acta Agrestia Sinica, 2009, 17(1): 52-57.)
- [18]王敏, 张从宇, 马同富, 等. 大豆品种苗期抗旱性研究[J]. 中国油料作物学报, 2004, 26(3): 29-32. (Wang M, Zhang C Y, Ma T F, et al. Studies on the drought resistance of seeding in soybean[J]. Chinese Journal of Oil Crop Sciences, 2004, 26(3): 29-32.)
- [19]周欢, 王承南, 谷战英, 等. NAA对水分胁迫下一品红幼苗叶绿素荧光参数影响[J]. 林业科技开发, 2009, 23(1): 78-80. (Zhou H, Wang C N, Gu Z Y, et al. Effects of NAA on chlorophyll fluorescence parameters of Euphorbia pulcherrimaseedlings under water stress[J]. China Forestry Science and Technology, 2009, 23(1): 78-80.)
- [20]张海燕, 焦碧娟, 李贵全. 大豆抗旱性鉴定指标评价的研究[J]. 大豆科学, 2005, 24(3): 183-188. (Zhang H Y, Jiao B C, Li G Q. Study on selecting targets in drought-resistant breeding of soybean[J]. Soybean Science, 2005, 24(3): 183-188.)
- [21]白伟, 孙占祥, 刘晓晨, 等. 苗期调亏灌溉对大豆生长发育和产量的影响[J]. 干旱地区农业研究, 2009, 27(4): 50-53. (Bai Y, Sun Z X, Liu X C, et al. Influence of seedling regulated deficit irrigation on growth and yield in soybean[J]. Agricultural Research in the Arid Areas, 2009, 27(4): 50-53.)

相似文献/References:

- [1]闫春娟, 王文斌, 涂晓杰, 等. 不同生育时期干旱胁迫对大豆根系特性及产量的影响[J]. (article.aspx?type=view&id=201301014) 大豆科学, 2013, 32(01): 59. [doi:10.3969/j.issn.1000-9841.2013.01.014]
- YAN Chun-juan, WANG Wen-bin, TU Xiao-jie, et al. Effect of Drought Stress at Different Growth Stage on Yield and Root Characteristics of Soybean[J]. Soybean Science, 2013, 32(01): 59. [doi:10.3969/j.issn.1000-9841.2013.01.014]
- [2]刘颖, 张明怡, 韩光, 等. 干旱胁迫下钾对大豆叶片保护酶活性及产量的影响[J]. (article.aspx?type=view&id=201102037) 大豆科学, 2011, 30(02): 341. [doi:10.11861/j.issn.1000-9841.2011.02.0341]
- LIU Ying, ZHANG Ming-yi, HAN Guang, et al. Effect of Potassium on Soybean Leaf Protective Enzymes and Yield under Drought Stress[J]. Soybean Science, 2011, 30(01): 341. [doi:10.11861/j.issn.1000-9841.2011.02.0341]
- [3]钟鹏, 吴俊江, 刘丽君, 等. 干旱胁迫对不同磷效率基因型大豆膜脂过氧化作用的影响[J]. (article.aspx?type=view&id=200804012) 大豆科学, 2008, 27(04): 610. [doi:10.11861/j.issn.1000-9841.2008.04.0610]
- ZHONG-Peng, WU Jun-jiang, LIU Li-jun, et al. Effect of Drought Stress on Lipid Peroxidation in Soybean Varieties with Different P Efficiency[J]. Soybean Science, 2008, 27(01): 610. [doi:10.11861/j.issn.1000-9841.2008.04.0610]
- [4]王伟, 姜伟, 张金龙, 等. 大豆种质的抗旱性鉴定及耐旱指标筛选[J]. (article.aspx?type=view&id=201505010) 大豆科学, 2015, 34(05): 808. [doi:10.11861/j.issn.1000-9841.2015.05.0808]
- WANG Wei, JIANG Wei, ZHANG Jin-long, et al. Selection of Drought-tolerant Soybean and Evaluation of the Drought tolerance Indices[J]. Soybean Science, 2015, 34(01): 808. [doi:10.11861/j.issn.1000-9841.2015.05.0808]
- [5]魏峰, 吴广锡, 唐晓飞, 等. 过表达GmHSFA1大豆在干旱条件下对高温的响应[J]. (article.aspx?type=view&id=201602012) 大豆科学, 2016, 35(02): 257. [doi:10.11861/j.issn.1000-9841.2016.02.0257]
- WEI Lai, WU Guang-xi, TANG Xiao-fei, et al. Soybean Responses to High Temperatures Under Drought Stress in the Presence of An Over-expressed GmHSFA1 Gene[J]. Soybean Science, 2016, 35(01): 257. [doi:10.11861/j.issn.1000-9841.2016.02.0257]
- [6]高鑫宇, 刘丽君, 刘博, 等. PEG 模拟干旱对大豆抗氧化酶活性及抗氧化能力的影响[J]. (article.aspx?type=view&id=201604015) 大豆科学, 2016, 35(04): 616. [doi:10.11861/j.issn.1000-9841.2016.04.0616]
- GAO Xin-yu, LIU Li-jun, LIU Bo, et al. Effect of Drought Stress Simulated by PEG on Antioxidant Enzyme Activities and Antioxidant Capacity in Soybean[J]. Soybean Science, 2016, 35(01): 616. [doi:10.11861/j.issn.1000-9841.2016.04.0616]
- [7]金毅, 郑浩宇, 金喜军, 等. 外源ABA、SA及JA对干旱胁迫及复水下大豆生长的影响[J]. (article.aspx?type=view&id=201606012) 大豆科学, 2016, 35(06): 958. [doi:10.11861/j.issn.1000-9841.2016.06.0958]
- JIN Yi, ZHENG Hao-yu, JIN Xi-jun, et al. Effect of ABA, SA and JA on Soybean Growth Under Drought Stress and Re-watering[J]. Soybean Science, 2016, 35(01): 958. [doi:10.11861/j.issn.1000-9841.2016.06.0958]

- [8] 刘丽君, 尹田夫, 孟良. 大豆原生质膜及混合细胞器膜脂脂肪酸对干旱胁迫的反应[J]. (article.aspx?type=view&id=199101007)大豆科学, 1991, 10(01):46. [doi:10.11861/j.issn.1000-9841.1991.01.0046]
[J]. Soybean Science, 1991, 10(01):46. [doi:10.11861/j.issn.1000-9841.1991.01.0046]
- [9] 谢青绵, 董钻, 赵艺新. 大豆器官间的热能分布与耐旱性的关系初报[J]. (article.aspx?type=view&id=199302003)大豆科学, 1993, 12(02):107. [doi:10.11861/j.issn.1000-9841.1993.02.0107]
[J]. Soybean Science, 1993, 12(01):107. [doi:10.11861/j.issn.1000-9841.1993.02.0107]
- [10] 刘莎莎, 柏新富, 冯春晓, 等. 干旱条件下土壤盐分对大豆生长及光合作用的影响[J]. (article.aspx?type=view&id=201706019)大豆科学, 2017, 36(06):921. [doi:10.11861/j.issn.1000-9841.2017.06.0921]
LIU Sha-sha, BAI Xin-fu, FENG Chun-xiao, et al. Effects of Soil Salinity on the Growth and Photosynthesis of Soybean under Drought Conditions[J]. Soybean Science, 2017, 36(01):921. [doi:10.11861/j.issn.1000-9841.2017.06.0921]

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