园艺学报 » 2013, Vol. 40 » Issue (11) :2137-2143 DOI:

果树

干旱胁迫下不同中间砧嫁接苹果苗的导水特性

张林森 1,*, 胥生荣2, 张永旺1, 胡景江3, 刘富庭1, 李雪薇1, 韩明玉1, 马锋旺1

1 西北农林科技大学园艺学院, 陕西杨凌 712100; 2 西北农林科技大学林学院, 陕西杨凌 712100; 3 西北农林科技大学生命科学学院, 陕西杨凌 712100

Hydraulics Characteristic of Fuji Apple Grafted on Different Dwarf Interstocks Under Drought Stress

ZHANG Lin-sen1,*, XU Sheng-rong2, ZHANG Yong-wang1, HU Jing-jiang3, LIU Fu-ting1, LI Xue-wei1, HAN Ming-yu1, and MA Feng-wang1

1College of Horticulture, Northwest A & F University, Yangling, Shaanxi 712100, China; 2 College of Forestry, Northwest A & F University, Yangling, Shaanxi 71 China; 3College of Life Science, Northwest A & F University, Yangling, Shaanxi 712100, China

摘要 以基砧为八棱海棠的4 种不同中间砧嫁接的苹果幼苗长富2 号/八棱海棠、长富2 号/M9、长富2 号/M26、长富2 号/SH6 为试验材料，研究干旱胁迫对其导水特性的影响。结果表明：在干旱胁迫下，4 种中间砧木嫁接苗的整体、冠层、茎干、根系叶比导水率均有减小，各器官叶比导水率基本趋势是乔化 > 半矮化 > 矮化，其中矮化中间砧的变化幅度最大，乔化中间砧的变化最小。中间砧嫁接口导水阻力表现为矮化砧比半矮化、乔化砧高，在正常水分条件下，八棱海棠、M9、M26 和SH6 中间砧嫁接区域导水阻力在植株总体导水阻力中所占的比率分别为4.07%、6.60%、4.97%和5.11%，当受到干旱胁迫后，嫁接区域所占比率均有不同程度减小。由于矮化苗有效导水率长期低下，根系吸水和运输水分的能力下降，导致地上部分水分供给减少，从而影响树体的生长。

关键词： 苹果 嫁接 干旱 砧木 水力学特性

Abstract: Fuji apple tree grafted on four types of interstocks[seedling Malus robusta（Carr.）Rehd., dwarfing M9, semi-dwarfing M26 and SH6] with seedling Malus robusta（Carr.）Rehd. were used to study the response of hydraulics characteristic to drought stress. The results showed that the leaf specific conductivity（Kl）of total plant, canopy, stem and root decreased with increasing drought stress, the trend of leaf specific conductivity（Kl）of each organ decreased in the order of seedling, semi-dwarfing and dwarfing, in which the range of change of dwarfing M9 was largest, and seedling was smallest. Hydraulics resistance of interstock graft union varied as follows: dwarfing trees > semi-dwarfing trees > seedling. The ratio of hydraulic conductance resistance of dwarfing rootstock graft union to plant in seedling, interstockM9, M26 and SH6 were 4.07%, 6.60%, 4.97% and 5.11% respectively under well-watered conditions, and decreased under increasing levels of drought stress. Dwarfing rootstock may block transportition of water to the canopy and limit vegetative growth, thus creating the dwarfing effect.

Keywords: apple, graft, drought stress, rootstock, hydraulics characteristics

基金资助:

农业部公益性行业专项（Nyhyzx07-024）；陕西省科技厅重大攻关项目（2011KTZB02-02-05）；国家现代农业产业技术体系建设专项资金项目（CARS-28）

引用本文:

张林森, 胥生荣, 张永旺等 .干旱胁迫下不同中间砧嫁接苹果苗的导水特性[J] 园艺学报, 2013,V40(11): 2137-2143

ZHANG Lin-Sen, XU Sheng-Rong, ZHANG Yong-Wang etc .Hydraulics Characteristic of Fuji Apple Grafted on Different Dwarf Interstocks Under Drought [J] ACTA HORTICULTURAE SINICA, 2013,V40(11): 2137-2143

链接本文:

http://www.ahs.ac.cn//CN/ 或 http://www.ahs.ac.cn//CN/Y2013/V40/I11/2137

[1] 朱世平, 陈, 娇, 马岩岩, 闫树堂, 钟广炎.柑橘砧木评价及应用研究进展[J]. 园艺学报, 2013,40(9): 1669-1678

[2] 陈学森, 王恩琪, 毛志泉, 张艳敏, 吴树敬.短枝型苹果新品种‘龙富’[J]. 园艺学报, 2013,40(9): 1851-1852

[3] 张 勇，付春霞，刘 飞，范晓丹，闫玉静，王衍安*，张友朋.不同时期叶面施锌对苹果果实中还原糖及糖代谢相关酶活性的影响[J]. 园艺学报, 2013,40(8): 1429

[4] 艾沙江 买买提，杨 清，王晶晶，刘国杰*.短截、拉枝、刻芽对苹果枝条不同部位芽激素含量的影响[J]. 园艺学报, 2013,40(8): 1437-1444

[5] 牛素贞1,2，樊卫国3,*.喀斯特地区古茶树幼苗对干旱胁迫的生理响应及其抗旱性综合评价[J]. 园艺学报, 2013,40(8): 1541-1552

[6] 沙广利, 郝玉金, 宫象晖, 束怀瑞, 黄粤, 邵永春, 尹 涛.苹果无融合生殖砧木‘青砧 1 号’[J]. 园艺学报, 2013,40(7): 1407-1408

[7] 宋 霄, 柏素花, 戴洪义.苹果*NBS-LRR1* 基因的鉴定与表达分析[J]. 园艺学报, 2013,40(7): 1233-1243

[8] 许瑞瑞1，张世忠2，宿红艳3，刘春香1，曹 慧1,*，束怀瑞2,*.苹果锚蛋白基因ANK家族生物信息学鉴定分析[J]. 园艺学报, 2013,40(6): 1021-

[9] 曹忠慧，王荣凯，郝玉金*.苹果MdMYB121基因异位表达提高烟草的抗逆性[J]. 园艺学报, 2013,40(6): 1033-