

明村豪,蒋芳玲,王广龙,胡宏敏,周学超,吴震.黄瓜壮苗指标与辐热积关系的模拟模型[J].农业工程学报,2012,28(9):109-113

黄瓜壮苗指标与辐热积关系的模拟模型

Simulation model of cucumber healthy indexes based on radiation and thermal effectiveness

投稿时间: 2011-10-31 最后修改时间: 2012-03-31

中文关键词: [模型](#),[回归分析](#),[试验](#),[黄瓜](#),[幼苗](#),[壮苗指标](#),[辐热积](#)

英文关键词: [models](#) [regression analysis](#) [experiments](#) [cucumber](#) [seedlings](#) [healthy indexes](#) [accumulated product of thermal effectiveness and PAR \(TEP\)](#)

基金项目:江苏省自然科学基金项目(BK2008342);江苏省科技支撑计划(BE2009403, BE2009413);苏北科技发展计划(BN2010054);江苏高校优势学科建设工程资助项目

| 作者 | 单位 |
|-----|---|
| 明村豪 | 1. 南京农业大学园艺学院, 南京 210095; 2. 农业部华东地区园艺作物生物学与种质创制重点实验室, 南京 210095; |
| 蒋芳玲 | 1. 南京农业大学园艺学院, 南京 210095; 2. 农业部华东地区园艺作物生物学与种质创制重点实验室, 南京 210095; |
| 王广龙 | 1. 南京农业大学园艺学院, 南京 210095; 2. 农业部华东地区园艺作物生物学与种质创制重点实验室, 南京 210095; |
| 胡宏敏 | 1. 南京农业大学园艺学院, 南京 210095; 2. 农业部华东地区园艺作物生物学与种质创制重点实验室, 南京 210095; |
| 周学超 | 1. 南京农业大学园艺学院, 南京 210095; 3. 内蒙古赤峰市农牧科学研究院, 赤峰 024031 |
| 吴震 | 1. 南京农业大学园艺学院, 南京 210095; 2. 农业部华东地区园艺作物生物学与种质创制重点实验室, 南京 210095; |

摘要点击次数: 257

全文下载次数: 90

中文摘要:

为预测温室黄瓜幼苗的健壮程度,该文探讨了黄瓜根冠比、G值(全株干质量与育苗天数之比)、壮苗指数3个壮苗指标与环境温度和辐射的关系,以2个不同生态型黄瓜品种‘津春4号’和‘戴多星’为试验材料,通过分期播种试验及回归分析,建立了以辐热积为尺度的温室黄瓜壮苗指标模拟模型,并利用独立试验数据对模型进行了检验。结果表明,根冠比与辐热积曲线拟合度差,G值模型的模拟值与实测值符合度低。在该试验条件下,这2个壮苗指标均不适宜用辐热积做变量进行模拟。黄瓜壮苗指数与辐热积曲线拟合度高。模拟结果与实测值之间的回归标准误差(RMSE)为0.0040,说明模型具有较高的预测精确性;壮苗指数的模拟值与实测值之间基于1:1直线的决定系数(R²)分别为0.9854(津春4号)和0.9761(戴多星),F检验均达极显著水平,表明模拟值与实测值的符合度高。该研究建立的基于辐热积的黄瓜壮苗指数模型能较准确的预测黄瓜幼苗健壮程度,所用参数少,模型实用性较强,可为黄瓜育苗中幼苗健壮程度的预测提供有效方法,也可为黄瓜育苗中的温光管理提供决策支持。

英文摘要:

In order to improve the predicting ability of healthy degree of cucumber seedlings, the relationships of both temperature and photosynthetically active radiation (PAR) with the root-shoot ratio, G value (the proportion of the total dry weight to the numbers of days of seedling) and healthy index of greenhouse cucumber was investigated. Using two different ecotypes of cucumber varieties ‘Jinchun No. 4’ and ‘Deltastar’ as tested materials, the models of cucumber healthy indexes based on thermal effectiveness and PAR (TEP) were developed through different sowing date test and regression analysis, and models were further verified by independent test data. The results showed that root-shoot ratio was poor fitting with TEP, and G value simulation model had low compliance between simulated and observed values, unsuitable for simulation taking photothermal product as a variable in this experiment. Healthy index simulation model was well fitting with TEP. The root mean squared error (RMSE) between the simulated and measured values of healthy index was 0.0040, showing a high predictive accuracy; and the determination coefficients(R²) between the simulations and measurements for the healthy indexes were 0.9854 (Jinchun No. 4) and 0.9761 (Deltastar) respectively. They all passed F test, and there were extremely significant level, showing an excellent conformity between simulated and measured values. Based on the results it is concluded that the healthy index simulation model can give a satisfactory prediction of healthy degree of cucumber seedlings. The model developed in this study is applicable with few parameters and can provide an effective method to predict the healthy degree of cucumber seedlings and decision support for the temperature and light and temperature management of greenhouse cucumber seedling cultivation.

[查看全文](#) [下载PDF阅读器](#)

关闭

您是第5194157位访问者

主办单位: 单位地址: 北京朝阳区麦子店街41号

服务热线: 010-65929451 传真: 010-65929451 邮编: 100125 Email: tcsae@tcsae.org
本系统由北京勤云科技发展有限公司设计