黄瓜叶片喷雾药液持留量试验 Experiment on Retention of Spray Liquid on Cucumber Leaves

陆军 贾卫东 邱白晶 李萍萍

江苏大学

关键词： 高压静电喷雾 流失点 最大稳定持留量 接触角 施药量

摘　要： 为研究喷雾药液在靶标植株黄瓜叶片上的流失点与最大稳定持留量，以炮塔式压力雾化轴流风送高压静电喷雾系统为试验平台，采用微称量法对其进行了测量。引用润湿方程的基本理论，对影响持留量的因素（喷雾距离、雾滴叶面接触角及施药量）进行了分析，探讨各因素对药液持留量的影响规律。试验结果表明：随着喷雾距离的增加，药液在黄瓜叶片上的流失点和最大稳定持留量先上升后下降，最大值均出现在距离喷头125cm处；药液雾滴在黄瓜叶片上的接触角θ、粘附张力β、粘附功Wa和临界表面张力γ0的稳定值分别为85.07°、6.17mN/m、77.97mJ/m2、61.23mN/m；黄瓜叶片持留量在施药量为1.26～3.36kL/hm2范围内出现峰值，超过该范围后持留量随着施药量的增加而减少并逐渐趋于稳定。 With the aim to study the point of run-off and the maximum retention of spray liquid on cucumber leaves in greenhouse, the spraying experiment was performed with various charged voltage and spray volume. Taking the barbette model pressure atomization axial-flow air-carried high-voltage electrostatic spraying system as the experiment platform, the retention volume on cucumber leaves surface was measured by micro-weighing method. The factors on the retention volume were analyzed based on basic theory of Young's equation, including spray distance, droplet contact angle and spray volume. The results show that with the increasing distance, point of run-off and maximum retention rises firstly and then declines; the contact angle θ, adhesion force β, adhesion work Wa, critical surface tension γ0 is 85.07°, 6.17mN/m, 77.97mJ/m2, 61.23mN/m, respectively; the retention volume reaches the peak in spray volume range from 1.26kL/hm2 to 3.36kL/hm2, and then reduces and gradually stabilizes with the increasing spray volume.

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