

喷灌均匀系数的三次样条两次插值计算方法

韩文霆

西北农林科技大学

关键词: 喷灌 均匀系数 三次样条 插值

摘要: 为提高喷灌水量分布均匀性评价的准确性,当雨量筒径向布置时,为考虑所有测点数据对插值点降水深的影响,采用径向和周向两次的三次样条插值计算出未知点的降水深,从而计算喷灌均匀系数。以美国雨鸟30PSH型喷头雨量筒间隔为1 m和2 m的喷洒试验数据,计算网格点取1 m和0.25m,分别采用三次样条两次插值法和邻近四点距离线性插值法计算了克里斯琴森均匀系数。结果表明,均匀系数由高至低的顺序依次为采样间隔为2 m的线性插值、采样间隔为2 m的三次样条两次插值、采样间隔为1 m的线性插值和采样间隔为1 m的三次样条两次插值。采样间隔2 m比1 m计算出的均匀系数总体高3~4个百分点,三次样条两次插值法比邻近点距离线性插值法略低1个百分点,2种计算网格点间距下的均匀系数差值小于1个百分点。结果证明,采样间距、插值方法、计算网格间距对均匀系数的影响依次降低,三次样条两次插值法可以用来评价喷灌组合均匀系数。 A new evaluation method, with accompanying software SIUEW1.0, was developed to precisely calculate uniformity from catch-can test data. Water application depths of a rain-bird sprinkler 30PSH were calculated at each grid point. The Christiansen uniformity (CU) for four sprinklers in square and triangular spaced were computed with 1 m and 2 m spaces, and with 1m and 0.25 m grid spaces. The results showed that the sequence of CUs from high to low is 2 m sampling spaces by linear interpolation, 2 m sampling spaces by cubic spline interpolation, 1 m sampling spaces by linear interpolation and 1m sampling spaces by cubic spline interpolation. CUs computed from 2 m space catch-can data are greater than that from 1m space catch-can data by 3%~4%. CUs computed with cubic spline twice interpolation are less than that with linear interpolation by using nearest four points by 1.0%. The deviation between CUs computed from grid points with 1 m space and 0.25 m separately are less than 1.0%. It could be concluded from these results that the influence of sampling space, interpolation method, and grid space on CU is less and less in turn.

[查看全文 \(请使用Adobe Acrobat 6.0版本浏览\)](#) [返回首页](#)

[引用本文](#)