



## **Wind Flow Distribution to evaluate the effectiveness of shelterbelts in Oases of the Ulan Buh Desert, China**

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Shelterbelts are an important component and green barrier of desert oasis ecosystems. They profoundly affect the prevention of desertification and the increase in conservation and rational utilization of natural resources, particularly of trees, shrubs, and yield in arid and semi-arid ecosystems. To investigate the wind-protection efficiency of different shelterbelts, four representative type of shelterbelts were selected for field study in Oases of the Ulan Buh Desert, Northern China. Two types of shelterbelts were compared during leafing and non-leafing seasons. The results indicate that different shelterbelts have different values of wind-protection efficiency and different areas of effective protection. Wind-protection efficiency during the leafing season is much higher than during the non-leafing season for the same shelterbelt configuration. Wind flow distribution study based on multiple wind velocity observation sites to obtain velocity data and analyzed by geographic software. It not only models wind-speed variation but also reflects the characteristics of turbulence fields and more accurate than conventional observation which is a single row observation. Additionally, the effective protection area reflects shelterbelt wind-protection efficiency. This study is important in that it proposes the concept of effective protection area for future shelterbelt observations and offers a clearer understanding of the wind-protection efficiency of different shelterbelts in oases of the Ulan Buh Desert.