What Type of Wing Design Creates the Greatest Lift? "Dimpled Airfoil"

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Purpose Find which wing design produces the greatest lift by adding a dimpled airfoil to the camber. The hypothesis is that if using ‘dimpled airfoil’ principles and theories, if several scale dimples are placed upon a conventional airfoil’s trailing edge then air will stick to the pockets/dimples and decrease drag. Experimental procedures Conventional and dimpled conventional airfoil designs were created of balsa wood and clear plastic sheeting. A wind tunnel was constructed of wood and a Plexiglas panel with a one speed motor to make a smooth suction. Springs were installed in the Plexiglas holes on four vector points to allow movement. Wind speed was measured at 7.7 miles per hour. Aluminum rods extended from the pivot point allowing measurement. Each wing was flown at both a level position and at 10-50 degree angles. Observations & Data The conventional airfoil produced more lift than drag and gave a wider range of the forces displayed. The dimpled airfoil supported my hypothesis; the lift/drag ration is greater than the conventional. The behavior of the airfoil in this experiment gives further insight into what conditions that may work in higher stall points and decreased drag occasions. Conclusion The hypothesis was supported and the airfoil’s data can further be used to advance in aerospace. The induced drag over the airfoil was decreased so further research of this technology may produce more practical uses.

Awards Won:

Fourth Award of $500