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Site characteristics of established flea beetle colonies in western North Dakota

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Abstract:

A total of 59 USDA-APHIS flea beetle release sites were located and evaluated in 1998 on the Little Missouri Grasslands near Medora, North Dakota. Five hundred flea beetles were released at each site during 1993, 1994, or 1995. Five flea beetle species were released: *Aphthona cyparissiae*, *A. czwaline / lacertosa*, *A. flava*, and *A. nigricutis*. Physical characteristics of release sites measured were aspect, soil texture, landscape position and site micro-topography. Biological information recorded was control area, leafy spurge density and cover, and cover of co-dominant plant species in the control area. No pre-release site data was available. The data set was subjected to principal component analysis which reduced the dimensionality and eliminated random background variation. The number of significant PC's was determined using Fisher's Proportionality Test. No PC's were significant for any data set. However, area of leafy spurge control appeared to be the parameter with the greatest influence in graphically separating sample units (release sites). Nine sites having the greatest leafy spurge control (avg. 5,000 m²) separated when plotted on an XY-graph. A stepwise comparison was then made on these nine sites to determine the magnitude of importance of each physical parameter. The physical site variables ranked from most to least importance are as follows: (1) aspect, (2) micro-topography, (3) landscape position, and (4) soil texture. The nine sites had aspects ranging from 90° to 270°, a micro-topography of level to convex, were located on the upper portion of the landscape (upland or summit), and had sandy to silty loam soil textures. These physical characteristics would all contribute to the nine successful release sites having warm and dry habitats for the larvae to live in.