In field seasons 2007–2014 studies have been conducted reproductive scope *Hedysarum grandiflorum* which grows in the southern of the Volga Upland within the administrative borders of the Saratov region. The features, variability and the plasticity of phytocoenotic external morphological characters of pollen, fruits and seeds of sweetvetch are studied. Potential and real seed productivity are identified. The optimal temperature of sprouting of seeds and the dependence of sprouting and energy of sprouting of seeds from the keeping period are detected. It is shown that the germinating ability and germinating energy of seeds is not high and quickly
decrease with years of storage, while their scarification can increase these figures. Noted that the relatively low germinating ability of the studied seeds is offset by enough high productivity of individuals. Recommendations for the introduction of sweetvetch are gived.