In the present work I study possibilities of Czech morphological tagging by using statistical tagger based on hidden Markov models (HMM tagger). I especially intend to verify an influence of various size of training data, length of tagging history, setting n-parameter in n-best variant and reduction of tag set in history of tags to the successfulness of tagging. Text is completed with tables with results of tagger including comparison with previous results of other taggers. There is also a supplementary CD with test data and the program, which results are presented here.