ISSN 1392-3196 / e-ISSN 2335-8947
Zemdirbyste-Agriculture, vol. 101, No. 2 (2014), p. 169–176
DOI 10.13080/z-a.2014.101.022

Drying of forage grass seed harvested at different maturity and its utility value in autumn and spring sowing time

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Abstract

Tall fescue (*Festuca arundinacea* Schreb.), red fescue (*Festuca rubra* L.) and cocksfoot (*Dactylis glomerata* L.) are important fodder grasses, but in seed production, they are prone to seed shedding and certain yield losses. In practice, seeds are usually harvested at approximately 20–35% moisture content and then are additionally dried to the moisture content of 12% or lower. However, to prevent shedding, seed was harvested at 45% moisture content. The effects of drying temperatures of 70, 60, 50, 40, 30 and 22 °C on germination and dormancy of tall fescue, red fescue, cocksfoot seeds, harvested at moisture contents of 45, 35 and 25 %, were observed in the present study. The analysis was done immediately upon seed drying, then three, eight and fourteen months later, which corresponds to the autumn and spring sowing time in the continental part of central and south-eastern Europe. In all the three species, drying temperature of 70°C, regardless of the moisture content, and 60°C in the combination with a seed moisture content of 45%, reduced germination. After three months, the highest germination was detected in tall fescue harvested at seed moisture of 25% and dried at 50°C. Furthermore, the greatest germination in red fescue and cocksfoot was determined in seeds harvested with the moisture content of 35% and dried at 50°C. After eight months, the highest germination in tall and red fescue were determined in seeds harvested with the moisture content of 25% and dried at 40–50°C, while corresponding values in cocksfoot amounted to 25% and 22–30°C, respectively. A positive and significant correlation was established between seed germination and seedling vigour.

Key words: *Dactylis glomerata*, drying temperatures, *Festuca arundinacea*, *Festuca rubra*, germination and dormancy, moisture.

Introduction

Plants of the genus dactylis and fescue are important for the production of forage and energy in region of central and south-eastern Europe (Kanapeckas et al., 2011; Samuil et al., 2012; Tilvikienė et al., 2012). However, there has been a decreasing trend of forage grass seed production in Europe (Huyghe, 2010). The main reasons for this are rising prices of cereals (wheat, barley and others). A greater income is obtained by grain production than by seed production of grasses. And therefore, these two productions are competitors for acreages (Jensen, 2010). Due to highly variable yields and low prices of grass seed, on the one hand, and the increased price of wheat, on the other hand, farmers use these areas for the growth of small grains, especially wheat, which has lead to grass seed shortage (Jensen, 2010). For the reason of economic sustainability of fodder grasses production it is necessary to achieve higher and more stable yields. This can partly be accomplished by preventing the loss of seeds resulting from shedding. However, it is often unavoidable since the emergence of generative stems of the same plant is uneven and the differences are even more pronounced in the production plots, leading to uneven seed maturation.

Fodder grasses are harvested when the seed moisture content is 20–35%, whereby seed loss due to shedding can be up to 16.7% (Stanisavljević et al., 2010 b). In order to prevent yield losses by shedding it is possible to harvest seeds with a higher moisture content. In addition to preventing seed shedding, harvest of seeds with a greater moisture content is practiced when the crop is tangled and lodged and when the weather at harvest is cloudy and rainy. After harvesting, seeds are dried to moisture of 12% or lower. It is done either naturally (conventionally) or in dryers at various temperatures.