

Silage sorghum and maize intercropping in Hungary

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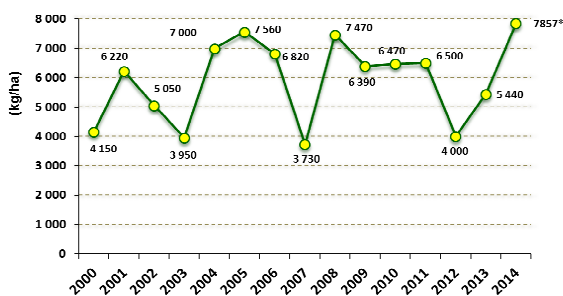
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On the basis of the official data issued in 2015 the number of cattle was 818 thousand in Hungary. Over the past five years, the growth has exceeded 100 thousand. The female cow population increased by 10 thousand/year and more than 50 thousand over the past five years. The higher proportion of the cattle population (62%) is kept by enterprises, and 38% is in the hand of individual farms.

The silage maize is the most important mass feed in continental Europe. The primary reason is that the corn silage provides the highest energy yield per hectare. What are the expectations from a good maize silage hybrid? They are the following: high green mass yield, high ear share, valuable nutrient content, good digestibility, slower dry-down rate, long stay-green (K. Móroczné-Salamon et al., 2014).

In an average year, the acreage devoted to silage corn production (80-90 thousand ha/year) is usually enough to meet the needs of feeding the cattle population. At the same time, in the extremely hot and dry years, the maize reacts very sensitively to the actual weather condition (Figure 1).

Figure 1. Country average yield of grain maize in Hungary (2000-2014)



Source: Hungarian Central Statistical Office

Our climate has become more arid with extremities due to global climate change during the past decades. In Hungary the arable crops are not irrigated, therefore the yield reduction - as a consequence of drought - cannot be estimated in advance.

In addition to the numerous green forage mixtures, the demand for silage maize and sorghum intercropping has come again into focus.

The farming technique planting silage maize and sorghum together has some tradition in Hungary. Several decades ago the procedure was successfully applied by the farmers. After dry years (2012-2013) it is getting to be more and more popular.

There are two, often applied farming techniques to plant mixed cropping, namely, either two rows of maize and two rows of sorghum side by side; or maize and sorghum planted in the same row upon each other.

Several years ago (1995) we compared the silage green mass and dry matter yield of our maize and sorghum hybrids. In this trial the best silage sorghum (Róna 4) had 48 % higher yield than the best silage maize (Sze TC 465) in extremely dry year (E. Rajki-Siklósi 1996).



GKT3485 and Róna 1 intercropping in Szeged in 2012 (dry year)



Szegedi 521 and Róna 1 intercropping in Szeged in 2014 (wet year)

We have gained similarly good yield by both technologies. The 2:2 row mixed planting of maize and sorghum gave 26% higher yield than maize. The mixed planting, in the same row upon each other, gave 36 % higher yield than maize. In this experiment, the mixed planting in the same row gave 10% higher yield than the planting model 2:2. The farmers usually prefer planting of 2 rows maize and 2 rows sorghum together, because it is a fairly easier pattern. We have to pay attention to the plant density of maize and sorghum, too. We suggest 65-75 000 plants/ha for maize and 180-220 000 plants/ha for sorghum production. If we plant them together in mixed cropping, the plant density has also to be decreased to the half. In a year with a lot of precipitation (like this season) we can harvest similar quantity of silage yield of maize and sorghum too.

Table 1. The most important quality parameters of maize and sorghum green mass, Kiszombor, 2016

Name of hybrid	Crude protein	N-free extract	Crude fiber %	NEI (MJ/dry matter kg)	Sugar % (in juice of the stem)
	in dry matter				
Róna 1 (sorghum)	5.8	68.1	20.7	5.2	16
GK Áron (sorghum)	6.2	66.8	18.3	5.1	15
GKT3485 (maize)	4.6	72.4	17.0	7.1	-
Szegedi 521 (maize)	4.8	71.4	16.9	7.0	-

At the same time silage blend made from the sorghum and maize planted together has more favorable quality, than high yielder silage sorghum alone. So if we make mixed silage from maize and sorghum 1:1, maize increases the energy value of the silage blend, and ensures the appropriate feed value for dairy cows (Table 1). Sorghum stays green even in dry years till harvest providing enough moisture and sugar for the rapid and optimal fermentation of silage. It is an important task for the farmers to find the best matching between the silage maize hybrids and silage sorghum hybrids within the same maturity groups.

References:

- E. Rajki-Siklósi: Silage sorghum production and utilization in Hungary. Maize and Sorghum XVIIth Eucarpia Conference Thessaloniki (1996) p.127.
 K. Móroczné-Salamon, Z. Pintér, S. Szél, L. Kálmán et al.: Results of silage maize trials in Cereal Research Nonprofit Ltd.. Research Forum, Szeged (2014.)