SUMMARY

Livestock occupies an important place in modern agriculture, sustainable, as they provide much of the food resources needed for human consumption. This important branch of agriculture is subject to the provision of fodder for animal feed needs. This should be to develop and apply new technologies of plant feed.

In balancing rations, fodder maize is of particular importance and can be used as fodder and pickled green mass. Corn silage allows changes in the type of food, in winter, helping to close for feeding to feed succulent, as in the summer time.

Maize for green mass is a source of feed to ensure juicy fodder, especially in the drought of summer-autumn months.

Corn feed is of great ecological plasticity, is very productive (25-46 t/ha), with high digestibility and consume and can be grown in primary culture or successive culture and it is fit to complete mechanization. Corn silage is easy because of the high containing in carbohydrates and water. Corn capitalize well organic and mineral fertilizers, irrigation water, can grow on many soil types in different climatic conditions, is resistant to drought and fall, less attacked by diseases and pests and can support monoculture.

This paper is a contribution to concerns among national and international level on improving technologies for growing maize in pure culture or mixed with soy.

The doctoral thesis is structured in eight chapters and subchapters, ending with valuable lessons and an extensive bibliography, with local and foreign authors.

Part I - Literature study, includes three chapters:

Chapter I - treats the importance, origin and spread of maize. It highlights the importance of maize in animal feed because of high production capacity, consuming and high digestibility, using the long form of mass pickled green or fodder. It specifies that the origin of maize is in America, the Mexico-Guatemala centers north of the Equator and central Peru-

Bolivia south of the Equator. In Europe, corn was first cultivated in Spain (brought by the first shipment of Christopher Columbus, in 1493), then spread to Italy. In our country, maize was mentioned in Muntenia during the reign of Şerban Cantacuzino (1693-1695), and grown in Transylvania during the reign of Maria Theresa (1740-1760). As a forage crop, corn was first cultivated in the nineteenth century in France and then spread gradually in many countries in Europe and North America. Corn is widespread in the northern hemisphere (Canada, Russia) and the Southern hemisphere (New Zealand), in dry areas with annual rainfall below 250 mm and in areas with annual precipitation exceeding 1200 mm. Corn ranks third in the world, as the plants grown, with about 140 million hectares.

In our country areas occupied by corn feed have changed depending on the livestock and the application of land law, after 1990. Thus, if in 1980 the area was 343.0 thousand hectares, in 1994 fell to 203.0 thousand hectares and in 2003 to 55.0 thousand ha.

Chapter II - describes technologies for green and silage cultivation of maize, specifying the aspects of technological links (rotation, fertilization, tillage, seed and sowing, caring work, harvesting and conservation of production).

Chapter III - highlights the current state of research in the country and abroad on fodder maize. In Romania, one of the first data about the technology of fodder maize, are reported by Coculescu Gr (1964), Moga I. (1967), Cucu I. (1969), Mate Şt. (1972), after which, since 1980, several researchers have dealt with this problem (Hera Cr. (1981), Dumitrescu N. (1984), Pânzaru D. (1993), Grecu C. (1993) , Murariu M. (1994), Carmen Ursache (2003), Dorica Voicu (2003) etc).

Among the studies made by researchers from abroad, with the technology of maize cultivation, we are listing: Nümez R. (1969), Troxler J. (1979), Vattikonda MR (1983), Pinter L. (1990), Muchow RC (1990), Coorss JG (1994), Le Gall A (1995), Daccord R. (1996).

Research conducted in fodder maize, both domestic and foreign researchers, included the influence of hybrids, the density of plants, fertilization with organic and mineral fertilizers, the irrigation and sowing time on production.

Part II - contributions to achieving the thesis and it includes five chapters.

Chapter IV - shows the research objectives, the research methods and biological material used. Research objectives were related to the influence of the cultivation type of hybrid and organic fertilizers and mineral fertilization on production, to the chemical composition, nutritive and energetic value and economic efficiency in corn silage and green mass.

- The research was done at the teaching resort Ezăreni farm belonging to the University of Agricultural Sciences and Veterinary Medicine of Iaşi, where they held two experiments, fitted by the method subdivided of type 2x3x6 parcels in 3 repetitions.

Experimental factors:

Corn silage

A Factor – hybrid maize: a_1 – 110 Iloaiei Podu-**a_2 –** Dekalb 355

B Factor – the cultivation: b_1 - sown in pure culture, maize 25 kg/ha, 70 cm between rows; **b_2** - mixed sowing, maize 15 kg/ha + soya 40 kg/ha) along the line; **b_3** - 4 alternating rows sowing maize 15 kg/ha + 4 rows soybean 40 kg / ha, in separate rows.

C Factor - fertilization: c_1 - control; **c_2** – stable manure 30 t/ha; **c_3** - complex fertilizer (22-22-0) 100 kg / ha; **c_4** - complex fertilizer (22-22-0) 200 kg/ha; **c_5** – stable manure 30 t/ha + Complex fertilizer (22-22-0) 100 kg / ha; **c_6** – stable manure 30 t / ha + Complex fertilizer (22-22-0) 200 kg/ha.

Maize green mass

A Factor – hybrid maize:a_1 – 376 Fundulea; **a_2 –** Fundulea 332

B Factor – the cultivation: b_1 - sown in pure culture, maize 80 kg / ha, 35 cm between rows; **b_2** - mixed sowing, maize (50 kg / ha) + soya (45 kg / ha) along the line; **b_3** - 2 alternating rows sowing maize (50 kg / ha) + 2 rows soybean (45 kg / ha) in separate rows.

C Factor - fertilization: identical with corn silage

Plants and soil quality analysis, interpretation of the production results and analysis were made according to experimental technique in use.

Chapter V - is a characterization of the natural area studied, the geographic specification, the geomorphology, geology, lithology, hydrography, climate and soil conditions.

The clime diagram experimental years (2004-2007), shows that there have been periods of drought in September of 2004 and 2006 and in May-July 2007.

In corn silage, analyzing how the growing influence of the average production (2005-2007) found that sowing the crop and mixed with soybeans on the same lines, resulted in achieving higher production of 1.9-2.1 t/ha as the alternative lines. The hybrid and the growing type influenced also the average. Thus, the greatest production occurred hybrid Podu Iloaiei - 110, grown in pure culture and mixed with soybeans on the same lines (12,7-12,8 t/ha to 10.6 t/ha alternative drill with soybeans). Hybrid productions Podu Iloaiei -110 were higher with 0.3-0.7 t/ha then hybrid Dekalb 355.

Fertilization resulted in achieving higher average yields, of 13.9-15.0 t/ha d.s, the administration of 30 t/ha stable manure + 100-200 kg / ha complex fertilizers. Hybrids and fertilization have made differences of production, more accomplished on the Dekalb 355 hybrid on fertilization with manure 30 t/ha + complex fertilizers 100-200 kg/ha, 14.6-15.2 t / ha, compared to only 10.6-10.7 t/ha for hybrid Podu-Iloaiei 110, the same dose of fertilization, but in pure culture (16.2 t/ha).

On the maize for green mass were studied the same issues as the corn silage. The cultivation type led to different productions: sowing maize with soybeans in alternate rows led to an average production of 9.7 t/ha, up to 1.2-1.4 t/ha at sowing in pure or mixed culture, with soybeans on the same lines. Cultivation type and hybrid have also led to differences in average yields, which are higher in hybrid Fundulea 332, mixed with soybeans grown in alternate rows (9.9 t/ha). Fertilization influenced the average, resulting in greater quantities in the management of complex fertilizers (8,4-9,2 t / ha) and manure + fertilizer complex (10.0-11.0 t/ha).

Hybrids and fertilization led to higher productions on Fundulea 332, in which was applied manure + mineral fertilizer (10.6-11.4 t/ha) compared to hybrid Fundulea 376, on the same fertilization (8.1-8.7 t/ha). The cultivation type, the hybrid and the fertilization, have influenced the average production. Higher production resulted from hybrid Fundulea 332, sown in alternate rows with soy and fertilized with manure + mineral fertilization (11.4-12.6 t/ha to 10.7-11.5 t/ha for hybrid Fundulea 376).

Chapter VII is broader and deals with the results of chemical analysis made for corn silage, whole plant corn and green mass.

On the corn silage was determined the fodder content in crude protein and crude fiber. On the hybrid Podu Iloaiei -110, the highest crude protein content was obtained from sowing corn mixed with soybeans in the same row (9.75-12.75 %, compared to sowing maize 8.15-10.15 % soybean in alternate rows and maize growing 7.25-9.40 % pure. On the hybrid Dekalb 355 was found the same aspect, higher crude protein content was recorded also in sowing corn with soy in the same line (9.70 -12.95 %) and smaller on alternative culture maize + soybean (8.30-10.30 %) and on pure culture (6.80-9.80 %).

It was found that on the Podu Iloaiei 110 hybrid the content of crude protein was higher than on the hybrid Dekalb 355. On both hybrids, fertilization complex fertilizers and manure + complex fertilizers has led to the highest crude protein content in all types of cultivation. The lowest crude fiber content was observed on Podu Iloaiei 110 hybrid in cultivation on the same maize + soybean lines (26.80-28.95 %) and on the Dekalb 355 hybrid maize cultivation in pure culture (26.95-28.30 %).

On the maize for green mass, a higher crude protein content was found both on Fundulea 332 hybrid and 376 Fundulea hybrid, where corn-soybean sowing was made on the same lines (12.15-16.70 % and 11.26-16.02 %). A lower content of crude fiber was found in both hybrids, on the maize cultivation with soya on the same row (24.05-27.20 %, on Fundulea 376 hybrid and 23.55-26.15 % on the hybrid Fundulea 332).

It was also established the nutritional and energetic value of corn silage and corn for green mass, under the influence of the hybrid, on the cultivation type and on fertilization with

organic fertilizers and minerals.

In corn silage, nutritive value expressed in UNL and UNC, was different depending on the hybrid, method of cultivation and fertilization. Thus, the hybrid Podu Iloaiei 110, the highest nutritional value expressed in UNL and UNC, was found in maize growing with soybean on the same line, which was fertilized with manure + fertilizer complex (0.86-0.88 UNL/kg d.s. respectively 0.83-0.85 UNC/kg d.s.). Net energy milk (ENL) and net energy meat (ENC), with high values was obtained also on the maize growing with soybean on the same line, which was fertilized with manure + fertilizer complex (1329-1359 kcal ENL, and 1287 – 1322 ENC kcal).

On the Dekalb 355 hybrid was found the same aspect as the Podu-Iloaiei 110 hybrid. Thus, the highest nutritional value was obtained from cultivation of corn-soybean blended along the same line, which was fertilized with manure + mineral fertilizer (0.86 UNL/kg d.s. respectively 0.83 UNC/kg d.s.), and the higher energy value is, on the same conditions, 1325-1326 kcal ENL and 1281-1283 kcal ENC. Higher nutritive and energy values were obtained from Podu-Iloaiei hybrid 110.

On the maize for green mass were made the same determinations as in corn silage. Fundulea 376 hybrid, the higher nutritional value of feed expressed in UNL and UNC, was on maize + soybean mixed culture along the line, which was fertilized with manure + fertilizer complex (1.00-1.02 UNL/kg d.s. respectively UNC 0.99-1.01/kg d.s.). The higher energy value of fodder recorded in the same conditions of cultivation and fertilization (1535-1572 kcal ENL and 1532-1576 kcal ENC).

On the Fundulea 332 hybrid, a higher nutritional value of fodder was recorded under the same conditions of cultivation and fertilization as Fundulea 376 hybrid, being 1.02-1.04 kg d.s. UNL respectively 1.02-1.04 / kg UNC d.s.) and the energy value of fodder was higher on the same terms (1578-1600 kcal ENL and 1584-1613 kcal ENC). The nutritional and energetic values of corn for green mass were higher on Fundulea 376 hybrid.

Chapter VIII - is an analysis of several economic indicators calculated for maize silage and green mass (total cost, production cost, net income and rate of return).

Thus, on maize silage, on the Podu Iloaiei110 hybrid, the highest production costs were recorded in maize growing with soybeans mixed on the same rows and in alternate rows, on fertilization with complex fertilizer (1020-1240 lei/ha), at the highest rate of return (444-657 % respectively 346-510 %).

On Dekalb 355 hybrid, high production costs were recorded in cultivation in pure culture, on the combined fertilization (1530-1630 lei/ha) and the highest rate of return was on the cultivation of maize + soybean on the same lines, in which fertilization was from manure + complex fertilizers (533-549 %).

On the maize for green mass, regarding the Fundulea 376 hybrid, higher production costs were recorded in cultivation in pure culture, in which fertilization was by combined fertilizers and manure + complex fertilizers (1650-1870 lei/ha), and a higher rate of return was on the cultivation of maize with soybeans in alternate rows, on the combined fertilization and complex fertilizers, manure + complex fertilizers (261-288 %).

On the Fundulea 332 hybrid, higher production costs resulted in the same conditions as the Fundulea 376 hybrid (1570-1790 lei/ha), with a rate of return of 227-303 %.

The doctoral thesis ends with recommendations and conclusions - a bibliographical list with local and foreign authors.