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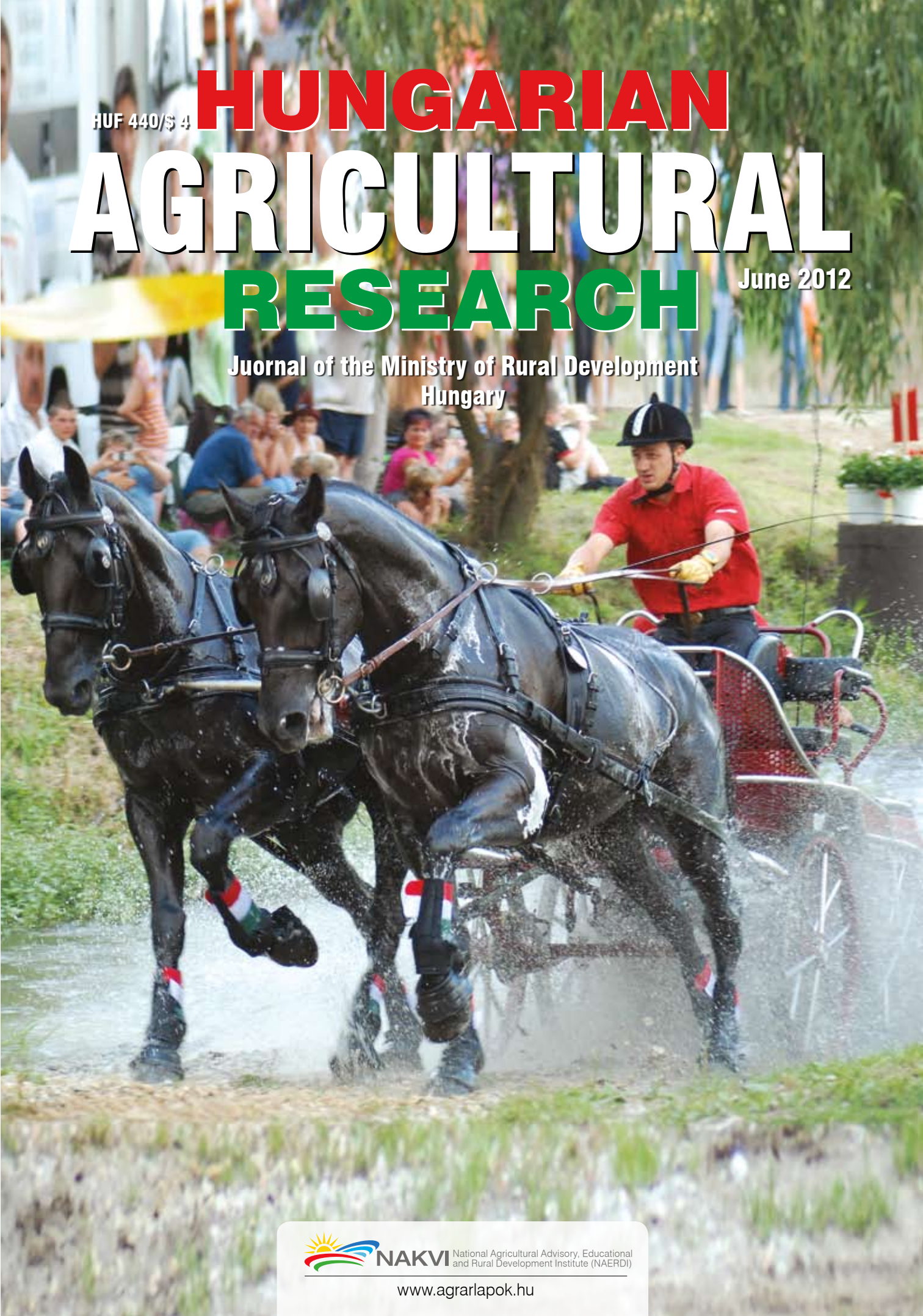

NAKVI National Agricultural Advisory, Educational and Rural Development Institute (NAERDI)

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The Ignác Darányi Plan – Rural Areas want to Flourish, Hungary will be renewed

"Hungary was always at its strongest when its agriculture was flourishing." These were the words of Prime Minister Viktor Orbán when, together with Minster for Rural Development Sándor Fazekas, he launched the Ignác Darányi Plan, the implementation framework programme of the National Rural Strategy (NRS), valid until 2020.

This is the first time in decades that a comprehensive, long-term plan of action has been formulated for the advancement of agriculture and rural areas. The Government and the Ministry of Rural Development wish to achieve the fundamental and radical reform of rural life with the help of the Plan.

Following a broad social debate, the Ministry has finalised the National Rural Strategy, which forms the basis of the Ignác Darányi Plan. The Plan is named after Ignác Darányi, an exceptional and prestigious politician active in the late 19th century and the early 20th century. Thanks to his almost 12 years as Minister, Hungarian agriculture was regarded as being among the best in Europe at the turn of the century.

The Ministry aims to apply the Strategy to help reform the whole of rural Hungary. To realise these objectives, the document determines courses of action in four comprehensive areas: agricultural economy, rural development, food economy, and environmental protection.

The goal of the Ministry is a secure, healthy food supply, the retention of GMO-free status, the development of the local economy and local markets, the creation of a sustainable agricultural structure, and the protection and preservation of natural resources. In harmony with the European model, the Strategy is committed to supporting family and individually run farms, small and medium sized businesses and their co-operative associations.

One of the major tasks of the Strategy is to increase job creation and employment in rural areas.

The National Rural Strategy includes 43 national strategic programmes and 7 regional programmes in 7 areas.

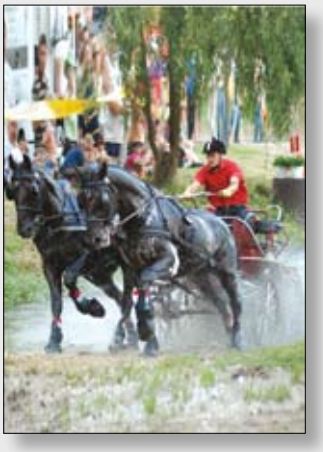
The concrete objectives of the National Rural Strategy include an increase in agricultural employment to 700 thousand by 2020, of the share of local distribution to 20 percent, and of the ratio of young farmers from 21 percent to 30 percent.

The implementation of the National Rural Strategy is provided for by the Ignác Darányi Plan, the goal of which is to achieve decisive changes in the life of rural Hungary based on fundamental pillars in 5 areas of action.

The first pillar aims at removing obstacles that hinder farmers and producers through the amendment of legislation and regulations. The second plans to reduce bureaucracy through the setting up of customer-friendly offices and by reducing administrative requirements. The third pillar focuses on changing people's way of thinking and on providing training courses. The fourth pillar will support rural areas in Hungary by launching jointly financed European Union and Hungarian tenders for rural development projects. The fifth pillar includes the preparation, launching and running of national programmes.

Both national and European Union funding is available for the implementation of the Ignác Darányi Plan, some 300 billion HUF until the end of 2013.

At the ceremonial launching of the Ignác Darányi Plan, Minister for Rural Development Sándor Fazekas emphasised, it is no accident that the motto of the document is: Rural Areas want to flourish, Hungary will be renewed! As he put it, "I trust in the fact that, similarly to Darányi, we will succeed in solving the tasks faced by rural areas and agriculture in Hungary. There is strength in rural Hungary. The stakes are high: the future of rural areas, the future of Hungary!"



Nonius mares at a driving competition
(photo by Péter Novák)

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Sándor Mihók[1] – Imre Bodó[1]

Horse breeding in Hungary, Hungarian horse breeds

Hungary contributed to the process making people believe that horse is the most wonderful companion animal in the history of mankind. It was a Hungarian man who gave Europe the light carriage that revolutionized traffic, and the Hungarian hussars laid the foundation for the modern army of light horsemen. In our former horse institute, Örkénytábor, qualified horse riding teachers established a coaching scheme that was used in Europe and America, helping other nations to have success at world championships and Olympics.

Our stud-farms in Mezőhegyes, Bábolna, Kisbér, Hortobágy and Szilvásvárad created the uniqueness of the whole culture of Hungarian animal husbandry. The horse breeds that were bred or whose purebredness was maintained in these stud-farms are appreciated all over the world. Horse breeding became an integral part of our deep-rooted culture.

After the Second World War, horses have not been used in wars any more. Motorisation was spreading rapidly in European agriculture. **By the 1960's, the horse lost the hegemony and social reputation of thousands of years, and new bases were established for its future**. Horses are presently used in equestrian sports and for healthy recreation purposes. Beside horse races, different equestrian sports were accepted as well. This occurred much earlier in Western Europe than in Eastern Europe where, in the new scale of values, the horse was first considered as an unnecessary remain of an outdated age with no need to make financial, spiritual or moral sacrifice.

Later this approach has changed, however, it is undisputable that horse breeding in Hungary is under the shock of decade-long changes in utilization and gradual loss of market share. As horse breeding and horse keeping is financed by income produced in other sectors, the status of horse breeding is still controversial.

The horse breeding of that era in well-capitalized countries can be characterised by breeding methods enhancing heterogeneity for quick genetic improvement by utilizing the gene effects induced by epistasis, dominance and special combining ability. From individuals originating from paired mating, the ones suitable for the given application are chosen applying great selection pressure. Using this deliberate, relentless selection, horses with amazing performance are put in the centre of breed image, and the inherent phenotypic and genetic difference between the breeds are eliminated by the identical breeding aims, breeding techniques and breeding partners, making the horses similar in appearance and pedigree. Even though the names of breeds have been kept, the maintenance and protection of genetic diversity is neglected. It is only the last few decades that the necessity of genetic diversity incurred in the case of domestic animal breeds.

Other nations, probably those with older horse breeding culture and less capital intensity preserve their old breeds, considering it as important as the market success of the breeds. This approach was insignificant for a long time during the period of drastic changes in the utilization of the horse, as a consequence of which the number of individuals in these traditional horse breeds decreased, especially in Hungary, and became endangered from the aspects of gene conservation. Some of them are now in critical situation. They are not competitive any more with international sport horse breeding using several thousands of mares. It cannot be disputed that less mental and financial energy has been invested in them in the last decades than in the breeds got in the world's front line, and they has not have successful market development strategy either, contrary to the world-wide breeds where the numbers of individuals have risen tremendously due to the above. The small-scale gene conservation subsidies were not substantial enough to bring a change and cannot balance the disadvantages.

By the 21st century, the view that various domestic animal breeds form important parts of the world's biological diversity had strengthened. In this modified scale of values, old breeds with special origin bred in relatively small number of individuals have become more

[1] University of Debrecen, Centre for Agricultural and Applied Economic Sciences, Department of Animal Husbandry

appreciated. The urbanised society has have ever increasing interest in domestic animal breeds in danger of extinction as they are unique and important documentations of the cultural history of the country's animal husbandry.

This mentality provides an opportunity for the preservation of Hungarian horse breeds for subsequent ages as there are hardly any horse breeds in Europe with such long histories that traditional Hungarian horse breeds as Mezőhegyes and Bábolna were founded practically at the same time as the original Stud Book of the stud at Lipica and the General Stud Book of the English thoroughbred horse were issued. The accumulation of genetic value started in 1785 in Mezőhegyes by the selection of mares establishing the breeds, and the collection of mares in separate studs. In only a hundred years, outstanding breeds, for which we were deservedly envied by the whole world, were developed by our brilliant breeders. Our breeds are genetically isolated from the European breeds, and most of them have pure-bred origin that can be traced back to 23-25 generations, making them exceptional from this aspect. It should not be forgotten though that Hungarian horse breeds are the live cultural treasures of our nation, reflecting the Hungarian breeding culture and the breeding knowledge gathered during the centuries. The protection and enforcement of national interests and values are important, just as the strengthening and utilization of national image and the realization of our interests in due time.

However, we should not believe and imply that traditional Hungarian horse breeds are outdated Hungarian specialities, useless remains of past ages which are to be exhibited in village museums and which should only be preserved because of national feeling or obligation. Even though our traditional horse breeds were developed centuries ago as military riding horses and harness horses, the basic traits required for such utilization are not inconsistent with the needs of modern equestrian sports. The requirements of modern equestrian sports have to be taken into consideration as it provides market for the breed and assists selection for the original essential quality and quantity traits.

As breeds stuck in rigidity cannot occur, the utilization of our military riding horses in equestrian sports cannot be considered as the breaching of the rules of gene protection since the preservation of genetic reserves cannot be carried out without selection. It is also obvious that not only the selection criteria of the eligibility for sports use but also many other requirements of gene preservation have to be met. All we have to consider is family breeding, the cornerstone of breeding, the conservation of genealogic lines being an integral part of the identity of each Hungarian horse breeds (*Mihók et al., 2001*).

In the short descriptions of our breeds we mention some traits that make the given breed suitable for equestrian sports.

The Gidran

Our earliest horse breed. It was developed in Mezőhegyes using classic line breeding for riding purposes. The process for the issuing of a registration certificate was started in 1855. By the beginning of the 20th century, it was made an elegant, easy-to-ride, talented, strong, tough military horse, and the determining Anglo-Arabian breed of Europe through the simultaneous use of inbreeding and combinative line crossing. Genetic diversity was

Gidran XI-4 (Sóhaj) OMÉK gold medal, one of the best military cross country horse of the world (photo: Péter Novotni)

Gidran XI-39 (Nimfa) at the international competition. Rider: Balázs Kaizinger (Photo courtesy of Sándor Jónás)

increased by English thoroughbred and Arabian horses used in different genetic frequency in the certain generations, influencing the appearance and the phenotypic performance as well. About 200 mares were used in the process of developing a uniform breed, but only 16 of them became family founders.

As a consequence of the tragic events of the First World War, only 13 Gidran mares left for regeneration, and the restoration of the genetic structure could be carried out in a surprisingly short time using the well-known techniques. Considering the changed circumstances and knowing the breed's performance, the army stud leaders wanted to develop the breed into one of the best steeplechaser types in Europe.

This process was interrupted by the Second World War, driving the breed in the direction of extinction again. After the war, only 28 mares were returned to Mezőhegyes from the stock that was tried to be put in place of security. The anti-equestrian animal husbandry politics after the Second World War made the situation even worse, but before complete destruction the protection of genetic reserves was initiated, among the first in the world, in Hungary. As a consequence, the breed revived again for the third time, which was started by a stallion (Gomul, later Gidran IV) repatriated from Bulgaria, exerting an imperishable breeding effect.

Due to the changes in the political regime, mare families originating from Mezőhegyes and transported to Radautz during the First World War could be purchased back after 1989. Stallions renewing the various genealogic lines were also taken to Hungary together with the mares representing significant genetic value. The proactive building and restoration of mare families and genealogic lines became a typical example of genetic reserve conservation.

The breed can achieve international success in military equestrian sports, which is verified by many victorious horses. Unfortunately, such successes are usually reached abroad as this breed is not yet attractive enough for Hungarian horsemen. Besides military riding, the outstanding abilities and value of this breed, which was once an elegant, noble military riding horse and a successful participant of drag hunting, dressage, show-jumping competitions, are now proven also in jumping. A particularly successful sports horse of the breed is Gidran XI-4 (Sóhaj). In 2004, Sóhaj won the title 'The best cross-horse of the world' at the military world championship of young horses. Gidran XI-39 (Nimfa) was also qualified in military riding at the Olympics of Beijing. Gidran XI-16 (Ima) is a reliable three-start horse of the military riding team of the Netherlands. This list can be continued with the horse Andor Gidran-10 (Nóé) or the stallion

Gidran Razbeg I-12 (Kismitok) which was the winner of the Dutch military championship in 2010. One of his stallion offsprings won the dressage event organized for Hungarian horses of the OTP World Championship in 2011. In addition to the mentioned ones, numerous other horses of the breed gained success in jumping and military championships as well.

In one of Europe's smallest half-bred populations, the valuable and unrepeatable basic stock is available. It is bred in accordance with the strict rules of gene reserve protection.

Furioso –North Star

The breeding of this breed started in 1841 in Mezőhegyes when the mares of the bay stud No. 3 and 8 (with Hungarian, Transylvanian, Arabian, Spanish, Nonius and Gidran origins) began to be mated with the unconquered English thoroughbred bay stallion, Furioso, bred in the stud of Count György Károlyi in Derekegyháza. The English thoroughbred breed became increasingly popular in Mezőhegyes because of this stallion. As a result, the bright black thoroughbred stallion named *North Star* purchased in England was taken to Mezőhegyes in 1852 with several other stallions. *North Star* covered the mares of the bay stud for 6 years.

The offsprings of these two superb stallions were gathered in a separate English-half-bred stud, and was purposefully mated among themselves after 1867. As a result of this systematic breeding method attached to Ferenc Kozma, the utilization and the effect of the region, the Mezőhegyes half-bred became a markedly massive English thoroughbred breed of Hungary as of 1881. Until the 1960's it was known as the popular universal riding horse for hunting, although the Furioso-North Star breed suffered great losses in the storms of time. Owing to its movement style and elegant appearance, the breed could produce successful dressage horses and even world champions in competitive driving also afterwards. It was and is still favoured also in equestrian vaulting because of its calmness. The Hungarian equestrian vaulting team used two Furioso-North Star stallions (North Star III. „Nomád" and Catalin XII. „Calypso") in competitions for several years.

As a result of the hardships, hardly any mare families that can be traced back to the original founder mare of Mezőhegyes remained. To maintain the breed's genetic diversity and the utilization, more and more superb individuals from

Furioso XX-108 sire

Furioso XIII stallion in free jumping corridor (Photo: Péter Novotni)

Romanian and Slovakian studs that has been bred separately from the Hungarian population for decades, are included in breeding.

Pure-bred breeding constituting a basis of gene preservation aims also at the maintenance of performance levels to meet the requirements of preservation with improvement.

The Nonius breed

During the Napoleonic wars, the Austrian imperial troops seized an Anglo-Norman light bay stallion named Nonius from the French stud of Rosières. The stallion was brought to Mezőhegyes in 1816. The stallion, now called Nonius Senior was used for covering mares for 17 years between 1816 and 1832. Of his offspring, 15 colts studded for a total of 100 years in Mezőhegyes. The consolidated traits of the breed was developed as a result of close breeding applied occasionally after the 1840's and the medium heavy military riding horse which was suitable for being used as harness horse as well that was demanded most by the army at that time. The modern genetic base of the breed was established with four genealogic lines.

The Nonius was widely used as harness horses in large estates as well, for instance at the royal lands in Gödöllő and at the Mezőhegyes Stud Farm. The variant bred here became the 'Ménesbirtok Nonius'

4589 Nonius XLIX-19 national stallion (Photo: Péter Novotni)

which was used for the regeneration of 'D' genealogic line.

Such large estates included the Nonious stock in Eltz Vukovar Stud (in Croatia) which was organized in 1868 using material from Mezőhegyes. The stud in Karadjordjevo (in Bácska) was formed as the colt farm of Mezőhegyes in 1913 and was breeding Nonius as of 1920. Up to the First World War, Upper Hungary (the stud in Kistapolcsány) was also supplied by Mezőhegyes with breeding stock. In Bulgaria, Nonius breeding started in the middle of the 19th century, in the horse breeding farm of Klementina in the province of Pleven.

In Debrecen, Nonius was bred using upgrading crossing. However, it was not only the city of Debrecen that supported the breeding of Nonius: Olivér d'Orsay, stud leader in Mezőhegyes gradually involved the small-scale breeders in the vicinity of Makó in breeding as of 1892.

The wide-spreading of the breed is no mere chance, but is the consequence of its excellent traits of utilization. Nonius is a heavy military riding horse that was perfect for the purposes of the army as artillery harness horse, training horse and it was also suitable for agricultural utilization, and became the main workhorse of that time. It is a calm harness horse that can work durably. The endurance and the aptitude to movement of the breed were proven many times in long-distance driving competitions. Its excellence manifests not only in driving and as harness horse but the offsprings provide very good performance in jumping after English thoroughbred stallions. Individuals with improved trotter ability can achieve international success in driving sports. Its unique image, outstanding harness horse skills, characteristic appearance and constant pedigree are merits that distinguish it from all other breeds and makes it highly valuable

The primary aim of breeding today is the preservation and improvement of the breed by the increasing of genetic diversity in order to achieve success at international driving competitions. It should be considered as endangered as – due to the insignificant demand for harness horses – considerable market growth can only be realized if other utilization fields are found.

Bábolna Arabian, today Shagya-Arabian

The Bábolna Stud, the cradle of the horse breed today known as Shagya-Arabian, was established in 1789 as the branch stud of the Caesarean and Royal Stud of Mezőhegyes with the main professional viewpoint of the superb quality of mares. The mares passing the strict performance tests in Moldova, Circassian, Transylvania, Hungary, Holstein and Mecklenburg were selected accordingly. The female descendants of these foundation mares became the brood mares in Bábolna after 1816, and were covered by original Arabian stallions. This is considered as the starting point of the separate breeding process of Bábolna Araber.

The history of Bábolna Arabian is also burdened by the hardships that our English half-bred horses suffered in the course of time. As a result of the prodigality in breeding material after the 1960's, there were stocks owned by horse breeders in Germany, Dania, Switzerland with large number of individuals originating from Bábolna. These horses were not acknowledged as Arabian horses by the World Arabian Horse Organisation (WAHO) founded in 1972 because not all their ancestors could be traced back to Arabia, even though their essential quality and quantity traits surpassed the original Arabian in many respects. It could be achieved, unfortunately not on the initiative of Hungary, that these horses with documented pedigree originating from Bábolna are acknowledged by WAHO as a separate Arabian breed registered in a separate Stud book. This is how the offsprings of original mares from Bábolna and Radautz and Arabian stallions were acknowledged internationally as a separate breed in 1978 with the name *Shagya-Arabian*.

Bábolna was established as a military stud, therefore the breeding aim could not be anything else but the development of a noble, good-tempered, tough, high-performance

Kemir V-2 shagya national stallion (Photo: Tamás Rombauer)

Shagya coach and five, driver: Tibor Petkó Szandtner (Photo: Berta Waltner)

military riding horse, keeping the hardiness of the Eastern horse. The Shagya-Arabian can be considered as a good breed for breeding sport horses even compared to the English thoroughbred. Besides Gazal VII that was taken abroad, the Anglo-Arabian Ramzes (father: English thoroughbred Rittersporn xx mother: Shagya-Arabian Jordi) make its mark in the history of sport horse breeding.

The Shagya-Arabian Bajar is the father of White Girl, the excellent German military horse and of Bachus, the steeplechaser horse with international successes. This excellent brood horse still has a male line in the Holstein stud. From this genealogic line, Pamír, the Hungarian O'Bajan XX offspring, finished third at the dressage contest of the Hungarian Championship and is gaining victories at international show-jumping competitions as well. O'Bajan XXII Csillag and O'Bajan XX-6 Pagát could win also at the European Shagya-Arabian Championship in Kreuth, Germany. An offspring of Siglavy Bagdady VIII sire became the world champion of endurance riding a few years ago at the Aachen World Equestrian Games. Within the Arabian breed group, Shagya-Arabian is a breed with relatively large body, attractive, noble appearance which can be used for riding and driving as well. Its temper and performance meet the requirements of recreational activities and equestrian sports, endurance riding and hunting.

Kisbéri half-bred

Within the Austro-Hungarian Monarchy, the Hungarian (military) horse breeding had a distinguished position. For developing military riding horses, the involvement of high-quality stallions in breeding seemed to be the fastest way to provide success. This requirement led to the plan of establishing a new stud in addition to the existing military studs in Mezőhegyes (1785), Bábolna (1789), Radautz (1792), Piber (1798).

The estate in Kisbér of Count Kázmér Batthyány, who was sentenced to death for his role in the Hungarian Liberty War in 1848-49 by a judgment delivered by default, confiscated for the state was assigned for the new stud to be founded.

The aim of the stud was to breed pure-blood light military riding horses. The top-rank thoroughbred stallions used in the stud enabled the development of a tall half-bred breed similar to the English thoroughbred but being calmer, more massive and having more correct appearance, the stallions of which met the requirements of public breeding as well.

Initially, the breeding method of upgrading crossing was applied, by using English thoroughbred stallions to cover the mares that got more and more uniform as a result of systematic selection, until the breed became very similar to the thoroughbred in type and characteristics. Later Furioso-North Star stallions from Mezőhegyes (including North Star XXV) were involved in breeding, then- as of 1904 - *Fenék I*, the first half-bred stallion born in Kisbér was also used. This is considered the turning point when the stud stock developed into a breed.

After the First World War, the stud's breeding scheme changed significantly. In the period between the two world wars, thoroughbreds were rarely used, instead the half-bred offsprings of time-honoured stocks were involved. In order to improve body mass, aptitude to movement and utilization traits, two Trakehner stallions (*Széplak* and *Formás)* were imported in 1941. Both of them founded lines that still exist today.

After the Second World War, one and a half decades were spent for the regeneration of the stock. Most of the valuable traditional lines could be revived in spite of the harsh conditions. The breeding concepts changed in the early 1960's, setting the target of sport horse breeding for all warm-blood foundation stocks. Upon the pretext of this, the best mares of the stock were covered by untested low quality imported stallions, the representative of the traditional lines vanished in public breeding stations in remote places, causing irreplaceable genetic loss to the breed. Attempts to save the

Bob herceg Bársony Kisbéri half-bred national sire (Photo: Péter Novotni)

Tangó Kisbéri half-bred, bronze medal winner in world championship for one-horse carriage. Breeder: Dr. Lajos Szabó, Driver: (Photo:)

existing lines were made in the 1980's but only moderate success could be achieved because of the fast-paced liquidation of the large-scale studs.

The genetic background of the breed predestined it for the sport performance of today. Large number of individuals could and can be found in the breed that can gain success in high-level competitions (show jumping – 140 cm, military – heavy class). At the Olympics of 1936 in Berlin, 3 horses with Kisbéri origins participated in the military team. At the Olympics of 1960 in Rome, István Suti took the tenth place in show-jumping riding *Széplány (Széplak – 94 Fortis)* bred in Kisbér. *Szépfiú,* winning the half-bred steeplechase race in Warsaw, *Dezentor,* gaining success in Pardubice, *Bíboros,* place winner in the military Olympics squad, and many other horses showing their outstanding abilities in national and international competitions belonged to the Kisbéri half-bred. In competitive driving, *Széplak VII, Filou V* and *Solymász I* stallions became European and world champions, and Maxim *Bella* was world champion twice with two-horse carriage a few years ago. Recently (in 2010) *Tangó*, bred by Dr. Lajos Szabó horse breeder in Hódmezővásárhely and possessed by an Italian owner won bronze medal in the world championship for one-horse carriage. In the competition of traditional Hungarian horse breeds organized in 2010 in the Papp László Sport Arena, almost all medals were won by Kisbéri horses.

Kisbéri half-bred horses can be profitably used in all branches of equestrian sports. Although the breed was loosing fame established between the two world wars at the turn of the century, making it less marketable, just as all other traditional breeds. The improvement of the breed's suitability for sports, the preservation of the genetic and cultural historic values, and the increasing of the number of Kisbéri half-breed fans are tasks to be carried out in the future, too.

The Lipizzaner

The breeding of this breed started in 1580 in Lipica (now belonging to Slovenia). The aim of breeding was the development of a magnificence royal horse that differs in appearance and movement from other horses for the purpose of drawing a carriage. It was selected from horses of Spanish and Neapolitan origin, taking into consideration the utilization defined in the breeding aim. Many military leaders, as the right of the winner, wanted to get hold of the first-rate individuals of the stud, and during the Napoleonic wars (in the early 1800's) the stud was put in place of security in Mezőhegyes, in accordance with the practice of Empire. After the stud was returned, a small stock was left in Mezőhegyes for several reasons which was developed into a sub-breed as a result of the consistent application of stud breeding

Favory XXVIII-5 national stallion after stallion examination (Photo: Péter Novotni)

Zoltán Lázár multiple world champion in competition driving during racing with Lipizzaner coach and four (Photo: Péter Novotni)

principles. The Lipizzaners bred in accordance with the breeding method of Mezőhegyes were first taken to Fogaras, then in the early 1900's to Bábolna, and then in the 1950's to Szilvásvárad. Besides the state stud, there is an increasing number of private breeders throughout the country who deals with the breed. As the breeding of the breed has been performed in the country for nearly two centuries, it can almost be considered a Hungarian breed. The Lipizzaner bred here is a valuable variant within the breed as it represents a type that is hardly used in Europe by others than Hungarian competition drivers. The Lipizzaner may be the breed whose original utilization discontinued most, but it can still be documented that the breed will not lose its significance in the new utilization form that selects for the original essential quality and quantity traits, which is credibly proven by the successes gained in world championships of competition driving. The importance of the breed from the aspect of Hungary is further increased by the fact that the foundation stallion (Incitato Senior) of one of its stocks was born in Mezőhegyes.

Among warm-blood breeds, the Lipizzaner represents special merits. The breed is considered a substantial cultural value due to its long history and a genome exempt from English thoroughbred genes and as it preserved the old Spanish-Neapolitan horse type.

Hucul small horse

Hucul small horse is an extremely durable, tough, exceptionally intelligent breed developed by the Hutsul people living on the ridge rising above the Carpathian forest belt, at the river-head of the Tisza, Prut, Cseremosz, Putila, Brodina, in the borderland of Bukovina, Galician and Hungary. It was not created for being used in wars but by the continuous work in mountains, the permanent free-range lifestyle at the altitude of 2000 metres in very cold winters and hot summers, the low quality feed, and the manner of treatment that is characteristic to all equestrian peoples with primitive culture.

These horses are baggage horses with continuous readiness to work. There are no other breeds similar to it in this respect. The original utilization of this horse capable of safely and steadily ranging the most dangerous mountain paths of the Carpathians has changed by now. It can stand the tests of usage by military mountain rifleman corps.

After due training, these horses are used in many riding schools to be ridden by children, and are perfect for being used by children in equestrian sports. With experienced drivers, remarkable results can be obtained in driving competitions as well. Its good temper makes it ideal for recreational purposes. It is

Hucul stallion at breeding exam (Photo: Zsuzsanna Haga)

The Hucul horse stands the tests in children equestrian sports as well (Photo: Zsuzsanna Haga)

getting more and more popular in the equestrian sport called Hucul path consisting of 16 numbered natural and artificial obstacles where the horses' skills, bravery, obedience and endurance – the original essential quality and quantity traits – are put to the test.

The genetic diversity of the stock is guaranteed by the large number of mare families and the traceability to as many female individuals as possible (*Mihók, 2001*).

Beside the breeds with century-long histories, the Hungarian Cold-Blooded Horse with shorter breeding history and its special Pannonian variant, the Muraközi are also bred in Hungary.

The Hungarian Cold-Blooded Horse

The appearing of this horse in the Carpathian Basin is a question still under debate. It is a fact that the Kisbér Hungarian Royal State Stud involved 80 cold-blooded harness horse mares in breeding as of 1866. With regard to the breeding area of the cold-blooded horse, Henrik Döhrmann (1922) stated that farmers in Baranya county, with the exception of the districts of Pécsvárad, Mohács and Villány, were very eager to breed cold-blooded horses of Belgian type. Important and crowded horse-fairs were held in the national trade fairs in Baranyaszentlőrinc and Pécs. In his wording, the breeding of cold-blooded horses in Somogy was started not long before. He defined Zala county as the earliest breeding place of cold-blooded horses. To increase the efficiency of cultivation and plant production, large estates also intended to replace oxen with higher performing cold-blooded horses. These data subsisted in various descriptions as these stocks were not registered in stud books.

The period after the Second World War started a new chapter in the breeding of cold-blooded horses. The lack of agricultural tractive power and the export potential brought an upward trend in the breeding of this breed. At that time, 85% of the stock was of unknown origin, however, the breed's characteristics – resembling to Ardennes horses – were quite uniform. In order to improve the stallion stock, 59 Belgian-Ardennes stallions were imported from Belgium and 17 Ardennes-type stallions from France in 1948-1949. The imported stallions made the stock more resembling to the Ardennes and more uniform as well.

By the establishment of farmers' agricultural co-operatives int he

2086 Boróka (Photo: Péter Novotni)

Cold-blooded mares dragging the plough (Photo: Péter Novotni)

1960's, several co-operative studs were founded from the registered mare stocks owned previously by private breeders. After the 1970's the demand for horse-drawn equipment gradually decreased in the farmers' co-operatives due to motorisation. This had an effect also on the utilization priorities of the cold-blooded horse. Colts and meat production became the major benefits of breeding as against the utilization as harness horses. From the initial stallion stock, only 9 Belgian import (B-3, B-6, B-13, B-22, B-25, B-26, B-28, B-36, B-55) and one Hungarian (Péterhida muraközi) male lines exist. The genealogic line founders are farther back in the origin of the stock existing today that the forth ancestor line.

There is an ever increasing demand for continuous introduction of new blood, which is not encouraged by the risk of decreased genetic diversity but by the attraction in giant animals characteristic to the Northern German Plain. At the same time, the struggle to preserve the cold-blooded horse type developed in Hungary was also started.

The Muraközi horse

Muraközi is the cold-blooded horse breed of Hungary with no Belgian-Ardennes genes. It was developed along the Mura river in an area belonging to four countries, namely Croatia, Hungary, Slovenia and Austria. Therefore, this horse is not the national cultural heritage of a country but of the united Europe.

In the Western and Southern part of Hungary, in the Mura-köz, a more intensive, agricultural farming was carried out due to settlement structural and geographical conditions, which required the 'modernisation' of the draught animal power. In this region, a fairly motile cold-blooded horse with smaller weight and height at withers developed mainly on Noriker basis by the beginning of the 20th century that was not uniform in appearance, yet showed great similarity. Brisk commercial activity could be observed here between the peripheric counties and the Eastern Austrian provinces, including horse-fairs and mating horses during the transportation of goods.

The breeding area of the Muraközi horse slowly expanded over the Mura-köz and reached the region of former Croatia-Slavonia, and later this horse was bred in the majority of Vas county (Pinkafői horse). Beside the favourable climatic and plant production conditions, the breed's very good utilization value played a

Muraközi mare (Photo: Zoltán Kovács)

Muraközi mares performing work in winter at the Örség National Park (Photo: Zoltán Kovács)

role in the formation and spreading of the breed. It was described in its days of glory as follows: "It is not fiery at all, instead it is calm, sweet-tempered, benevolent and hard-working. It is very greedy, not choosey and – in spite of its loose body – is very healthy long-lived horse.

It always has to be emphasized that the Muraközi is not a deteriorated Hungarian cold-blooded horse. We are in the last minute of the preservation of this horse. Being aware of this, the Directorate of the Őrség National Park started the breeding work. The breeding aim and the measurable well-expressed traits making the Muraközi clearly distinguishable from other breeds were defined with the help of experts. Except for some private breeders, the breeding of Muraközi horses is limited to the stud of the Őrség National Park.

The Hungarian Sport-horse

Although it was developed in recent times using genetic material from abroad, the Hungarian Sport-horse is considered as a national breed.

The breeding was started with the mare stock of traditional Hungarian breeds that was most suitable for sports, using stallions found to be successful abroad. The breeding of this type was commenced in the 1970's in the Mezőhegyes stud, and there was a great demand for the development of a sport horse competitive in international equestrian sports, especially in show-jumping among breeders and owners. When horses could be owned privately again, the majority of the new owners started to breed, reproduce Hungarian sport-type half-bred horses. The role and financial potential of Mezőhegyes shrunk into insignificance beside this in terms of quantity.

The professional work of the new breed's breeding is assisted by the breeding organizations appointed for

Timpex Alisco Hungarian Sport-horse (Photo: Péter Novotni)

Timpex Alisco in a jumping corridor (Photo: Péter Novotni)

the breed's maintenance. Breeding is carried out using about 2500 mares, applying relatively small selection pressure. Breeders import stallions with the best genotype of the world to facilitate genetic improvement. Today, the Hungarian Sport-horse can be considered rather a synthetic population than a breed in the classic sense. The applied breeding techniques also models the methods used for the development of synthetic breeds. This population is bred utilizing epistasis, dominance, special combining ability, and less importance is attached to additive genetic effects. There is great potential in this breed. From the aspect of international competitiveness, limited financial resources and the lack of preparedness may raise difficulties.

In the country several foreign horse breeds are present whose maintenance is relatively simple. The improvement of genetic diversity, the increase in performance and the establishment of a population representing a genetic value equal to that of the stock of the breeder country depends on the owners' intentions and financial resources. The owners and breeders are assisted in this process by the breeding organizations appointed for the breed's maintenance.

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Szilvia Erdeiné Késmárki-Gally[1] and István Szűcs[2]

Situation of the agricultural technical development in Hungary

The economic development is generated by the continuous technical-economic innovation, which is based on basic and applied research.

The concept, the target system and the determination of the substantive question of modernity of technical development has been in forefront of year-long professional discussions in Hungary. Today the technical development is a generally accepted and applied economic category regarding all sectors of the national economy.

By the technical development of the agriculture, we mean all technical, biological, genetic, human, organizational-control, informational and informatics activities of the science and direct production work, which we use to substitute the conventional with a new one, which changes the production tools, the condition system of the production, the work developments and the produced products for the society or for a smaller community in a useful way.

In the agricultural development of the world, and mainly of Europe, the direction, which, affected by the technical development, led to the dynamic increase of the agricultural production can be clearly observed.

Technical development and return profit of the factors of production

In the production developments the factors of productions are to be developed and integrated into the production-technologies that are concerning the enterprise the final goal is to generate profit.

The competition among the enterprises is determined by the differences of the production costs per unit of product in the forprofit sector (Késmárki-Gally, 2006). Of course the scale of production, the market position development of the products and the more advantageous sales prices are also important but are not determinant factors in the competition. The situation is more complicated in the agricultural sector because of appearing of some types of the incremental benefits, and this complicates the decision-making.

The following incomes can be distinguished in the agriculture (Szűcs et al., 2004).

– Average income: the average profit obtained by one fold and permanent labour and other materialized labour inputs.

– Additional average income: the content is the same as the previous but it means the income generated by the additional investments.

– In the sectors of exploitation, where – due to ecological conditions – the permanent (of rental-type due to the scarcely available area and mine assets) incomes generated or obtained land lease on land of better soil quality (than the mines and water resources) than the worst quality (marginal) of soil which is cultivated.

– Permanent income or technical rental (for land, mine water etc.) generated by utilizing production areas (of resources) better than the marginal ones and by applying a technology better than the average.

Analyzing the economical characteristics of the returns it can be emphasized that the economic precondition of all types of factor returns is to apply the appropriate level of technology in the production process. Therefore has the technical-technological development so important role.

In order to understand the significance of the technical-technological development we have to find a solution for the quantification of efficiency and the required methodology has to be developed.

The simplest formulation of the theory of returns ignores foreign trade, does not differentiate between fixed and current assets, i.e. the part of current assets to fixed assets. Accordingly, the "y" the net national production is described as a function of the labor and the fixed assets or the volume of production is clearly explainable by the size of the expenditures:

$$y = y(K, L)$$

where:

K=capital

L=labour

But this assumption can be considered true only at the given time, because with time, the technical knowledge is expanded and with this, the same volume of pro-

[1] Hungarian Institute of Agricultural Engineering, Gödöllő. E-mail: galli.szilvia@gmgi.hu
[2] Szent István University, Institute of Economic Analysis and Methodology, Gödöllő

duction by fixed means and living workforce provides larger output. Based on these, this process is also the function of the technical level (Szakolczai, 1966). So, the development of the technical level in function of time can be described with the following:

$$y = y(K, L, t)$$

In the work of Szakolczai (1966) „*t*" marks the time-distance, while for us, with this mark the time necessary for the introduction. So the increase of production depends on the increase of expenditures and the increment of these, the passing of time, and its' specific increment, the technical development.

A further thought is, if the technical development can be represented with the equation or other similar way independent of the expenditures, then the influence of the development will be really joined to the expenditures.

One part of the technical development shows up in the improvement of technical parameters of the fixed means, the other part is the better qualification and higher efficiency of the workforce taking part in the production, and the other parts are such actions, that result in the better arrangement of work.

The output of the agriculture is influenced by the quality of the land, namely there are always ones with better and ones with worse yield. Furthermore, the quality of the land determines the structure of the production, as on a specific quality of land, only specific crop cultures can be grown efficiently. The type of plants, possible to grow on a specific land can be extended with the increase of expenditure; the different crops can be grown with different technologies. The applied technologies and the type of technical development are determined by the profitableness and asset, land, work availability. In agriculture, the size and quality of the land, and the quantity and structure of the available workforce, and the ration of these, the land availability are usually nature defined. The quality of land and the land availability determines the production structure and its device demand.

In case of measuring the agricultural technical development for determining the increment of the production elements, the starting point can be the modified Cobb-Doulas-type function, describing the connection between the three main production elements and the pure earning (Szűcs, 1998):

$$y = a \cdot F^{\alpha} L^{\beta} T^{\gamma}$$

where:

y = net return of crop raising;

F = land quality;

L = labour;

T = fixed capital value (without land value).

From the function, with simple rearrangement, the contribution to the income increment of each production element can be expressed.

$$F^{\alpha} = \frac{\frac{y}{a}}{L^{\beta} \cdot T^{\gamma}}$$

$$L^{\beta} = \frac{\frac{y}{a}}{F^{\alpha} \cdot T^{\gamma}}$$

$$T^{\lambda} = \frac{\frac{y}{a}}{F^{\alpha} \cdot L^{\beta}}$$

Instead of the production-function type mentioned above, a function with more arguments can be used, while during the fitting of a linear type function, the contribution of each factor can be more easily estimated. In case non-linear functions, it is feasible to start from the logarithm of the functions, and calculate the contribution of each production elements according the following form:

$\log y = \log a + \alpha \log F + \beta \log L + \gamma \log T = 1 = 100\%$

Accordingly the contributions of distribution ratios are as follows:

$$\frac{\log a}{\log y} = m_1$$

$$\frac{\alpha \log F}{\log y} = m_2$$

$$\frac{\beta \log L}{\log y} = m_3$$

$$\frac{\gamma \log T}{\log y} = m_4$$

The measuring of the return profit of the factors is a complex task. The productive efficiency of the lands in agricultural utilization is determined by the levels of ecological and economical factors, their internal coherence-system and consistence. During the determination of the calculations, it is feasible to take into account the soil quality, the device-availability-, life work density indexes, the quality of the industrial road-system, the distance of transport, the market circumstances, etc.

Measuring of the impact of agricultural technology development

In the past, several authors have done economy calculations, to evaluate the technological alternatives, which are based on the determination of the contribution to the covering stock (Wiles, 2004). In his work, Takács (2008) has evaluated the effects of technical development, including the effects of technical development subsidies. He has ascertained:

– measurable (the economical performance created by the subsidies);

– calculable (the economical return with the help of return indexes), which can be:

– production return (without subsidies: return of the investment value), which analyses the return of the sources raised by the agricole, leaving out of consideration, that the value of subsidies will become the part of his own possession;

– national return (return of investment value increased with the value of subsidies), which analyses the return of the agricole and the social transfer in total;

– immeasurable, mostly only estimative (the public, social effects and the created public properties – environmental effects, infrastructure, etc. – created by income).

The measuring of the effect of the technical development integrating into the production processes (manifesting) requires the application of more complicated mathematical-statistical methods. In the previous years we participated in several researches, team works, which were searching for the possibilities of measuring the technical-economical progress. Our studies were focused on whether the classical production functions can be converted to a format for measuring technical development. The separation of the return of the factors can usually be approximately calculated with the Cobb–Douglas-type production function in the case of a specific condition system. With a little modification, the C–D-type production function can be made proper for measuring the technical progress. The calculation method must be based on further simplifying assumptions even in this simplified form:

– The production development can be characterized on the different levels of the production through a production function, where the production function stands for the maximum production possibility.

– The producers either minimize their costs, or maximize their income.

– The markets are competitive and the participants of the market are price-takers, who can only change their own production, but cannot change the prices.

These conditions do not necessarily emerge in reality, but in numerous cases the actual market circumstances approach these conditions quite well.

Productiveness arises as a residue and it emphasizes the technological advancement not realised in the production function.

The scientific base circumstances of the technical development are created during the research, and after that start the tasks, of spreading the scientific results into the practice.

Regarding the measurement of the technical-technological development the classical production functions have to be refined. If the classical labour-capital-land relationship is described by the function of

$$\mathbf{y = f(M,T,F)},$$

than the production function characterizing also the technical development can be defined as follows (Szűcs et al., 2004):

$$y_k = f(M,T,F,H,t),$$

where:

y = profit

M = labour content (work)

T = invested capital

F = land

H = ratio of R&D to the GDP of all sectors

t = average time required for introducing the new research results (months, year).

The modified function is as follows:

$y_k = aM^{\alpha} T^{\beta} F^{\lambda} H^{\delta} t^{\varepsilon}$,

where the factors' index stands for their volume return.

For calculating the distribution ratios let us transform the function into a logarithmical version:

$\log y_k = \log a + \alpha \log M + \beta \log T + \lambda \log F + \delta \log H + \varepsilon \log t$

The contribution of the R&D activity to the generated profit is in percentage as follows:

$$H_{p\%} = \frac{\delta \log H}{\log y_k} \cdot 100$$

The role of the time required for applying the research results in profit generation:

$$t_{p\%} = \frac{\varepsilon \log t}{\log y_k} \cdot 100$$

Our conclusion is that the larger the difference between the efficiency of production technologies and the larger the extra profit generated by up-to date technical development the more urgent is the assistance to be provided to the introduction of new technologies (by encouraging or compulsion). The specified function, besides the macro economical level, is proper for examinations on sectoral and regional level, as well, if the information base necessary for the calculations is available.

The ecological conditions for agriculture are good in Hungary. Hungary's fundamental interest is to generate stable rental-type incomes provided by the good ecological conditions. Stable (rental-type) incomes can only be generated and realized if high-level technology is applied in areas with better ecological conditions.

It is verifiable that the economic development is generated by the continuous technical and economic innovation, what should be based on high level basic and applied research activity (Szűcs et al., 2006).

In his work, Mohamed (2010) has measured the intensity of elements of agricultural research and development which are affecting the agricultural GDP, and with the help of the above mentioned C-D functions, has demonstrated the role of agricultural research and development in the creation of agricultural GDP.

Analysing the development level and the R&D activity of the various countries of the world, based on diagram 1, it can be stated that between its proportions compared to the GDP/person there is an $R^2 = 0{,}74$ exponential type connection with high intensity. The calculation was made by us, based on the EUROSTAT (2008) data of the EU and EFTA

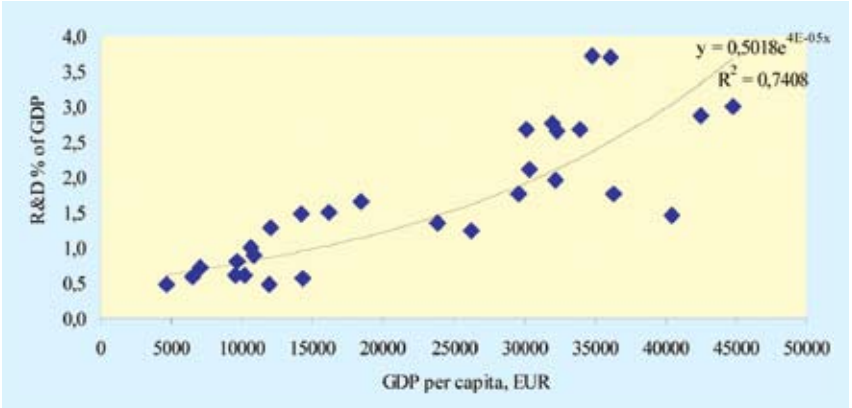

Figure 1. *The exponential connection between the proportion of the GDP/capita and the R&D expenditures compared to the GDP (without the data of Cyprus, Greece, Luxemburg, Norway and Liechtenstein, with the data of the USA, Croatia and Turkey)*

countries (without the data of Cyprus, Greece, Luxemburg, Norway and Liechtenstein, with the data of the USA, Croatia and Turkey).

Our conclusion is that the more powerful the economy of a country is, the more money it spends on maintaining and developing its technical level.

Some final comments

The impelling force of the technical development are the humans' creative, organizing, managing activities, which, having scientific-technical knowledge, and being aware of the principals of the expectable social-economical development, is capable of using the production tools reasonably and economically. The changing of the economical and agrarian economical factors also reacts upon the rate of the technical development in the future; it may accelerate it or hold it back.

The economical growth is affected and formed by various economical and social circumstances. Parts of these circumstances are the performed work, the asset available for the economy, the natural resources and the technical advancement.

The technical development cannot end in itself, it has strictly required economical purposes, and these purposes are in direct connection with the objectives of the agrarian sector.

The engine of the technical development is the continuous investment and the introduction of the new achievements of science as fast as possible. Without investments there is no technical development on the merits, but at the same time the investments lead to a proper technical development if it is based on a proper economy developing strategy, and if it is coupled with a technical developer and organizer activity. The key of promoting the advance is the economical acceleration of the technical progress.

The main tasks of the technical development of the agriculture in the future are the application of the biotechnological achievements, the improvement of the environment saving technologies and the adaptation of the precision plant cultivation systems. The universal objective of the agrarian-technical development is to provide technical base for the maintainable agricultural production, ensure the development through the preservation of the production base (the land, the biological environment, farm workers, the labour force). It requires the development of such production technologies, which protect the environment and the landscape, the soil and water reserves, ensure the quality of the product and the economy of the production. The further task of agricultural technology development is the development of a coherent system of electronics, informational technique and automation, construction of an agricultural information network and the transfer of the connected knowledge.

The competitiveness is basically influenced by the level of technical development.

It is the distinguished goal of the shared agricultural politic of the European Union, to increase the competitiveness and viability of agriculture, providing suitable livelihood for the people making their living from this activity, and to contribute to the present and future well-doing of the whole society. The base of increasing the competitiveness and viability is to increase the effectiveness. The agricultural development and the output increase of the EU countries are basically referable to the technical and technological increase. The base of the technological developments is the level of the domestic research activity, and the well thought-out adaptation. In most of the EU countries, the increase of the complex effectiveness indexes in major is the outcome of the technical development and only the minor part is coming from the increase of technological effectiveness (Holman, 2004).

The non-recognition of the rate or the characteristics of the technical development, its improper explanation may lead to great losses. Due to the special importance of the rate of the technical development, we need to pay special attention to all circumstances and factors, which boost the technical development, make the approach of the world standard possible and the catch-up with its progress. Therefore,

we need to take advantage of all opportunities, which are available for us due to our membership in the European Union.

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2011 was an Outstanding Year for Hungarian Agriculture

2011 was the most successful year for Hungarian agriculture since the country joined the European Union. It's no accident that Viktor Orbán referred to agriculture as a workhorse sector. The exceptional results were achieved despite the fact that last year farmers suffered from waterlogging, floods and drought.

Agriculture played a decisive role in a higher than expected 1.4% rise in the Hungarian GDP in Q4 of 2011. The output of the Hungarian economy increased by 1.7% in 2011, more than both the European Union average of 1.6% and the eurozone average of 1.5%.

Last year, agriculture achieved 6.2 billion Euros in exports compared with 3.8 billion Euros in imports. Such a high level of agricultural exports has never been achieved in any given year since Hungary joined the European Union. Exports rose by 17.5%, while imports increased by 15.5% compared to the previous year. Our agricultural import-export balance was 2.3 billion Euros, almost 10% more than in 2010, and equivalent to 35% of all exports within the entire national economy.

Of the new markets, the most significant is Russia, to which we exported 21% more goods – mainly fruit, vegetables and food industry products – than in the previous year. Russia is now among the country's ten most important agricultural foreign trade partners. One of the significant success stories of Hungarian agricultural diplomacy resulted in 126 Hungarian meat production plants and 3 dairy product plants receiving export permissions for the Russian market following negotiations lasting only three months. During the previous government, there were only thirty such businesses.

Hungarian agriculture is traditionally responsible for producing around 3% of the national economy's GDP, twice the EU average. The total agro business makes up 15-20% of the Hungarian economy.

Industrial investment in agriculture rose significantly by 11.7 percent in 2011. Investment by the processing industry and food industry rose by more than 24 percent.

Increased willingness to invest was partly due to the fact that farmers had also concluded a successful year, and so had more free capital available. Favourable prospects for the future of agriculture also did much to push investments in a positive direction.

The sum of money spent on the purchasing of new agricultural machinery and equipment rose by 83% in 2011 compared to the previous year, reaching a value of 78 billion HUF.

In addition to being a key factor in the country's economic performance, agriculture also plays a significant role in employment. Thanks to the new simplified regulations, the number of people employed in the affected sector doubled in a single year. While for example 254 thousand seasonal workers were registered by agricultural and tourism-related businesses in July 2010, this figure more than doubled to 512 thousand last year.

In the words of Minister for Rural Development Sándor Fazekas in assessment of the outstanding success of the 2011 year, "I have great faith in the future. Hungarian agriculture has a continued opportunity to strengthen, agricultural exports may be increased further; new markets have opened up before us: China, Russia, Kazakhstan, Saudi Arabia and Algeria. There is a huge global demand for food, the world population continues to grow, and the foundation of our food supply is agriculture."

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