



evropský
sociální
fond v ČR



EVROPSKÁ UNIE



MINISTERSTVO ŠKOLSTVÍ,
MLÁDEŽE A TĚLOVÝCHOVY



OP Vzdělávání
pro konkurenceschopnost

Mendelova
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v Brně



INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ




**Inovace studijních programů AF a ZF MENDELU
směřující k vytvoření mezioborové integrace
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**Tato prezentace je spolufinancovaná z Evropského sociálního fondu a
státního rozpočtu České republiky**

Viticulture

Significance and Importance



- Basic terms of viticulture and wine making
- Sites, varieties, statistics
- Wine origin
- History of viticulture and winemaking
- Production and other than production significance
- Natural wine, its significance

- Act No. 321/2004 Sb. providing for viticulture and winemaking defines following terms:
- VITICULTURE is an activity of a grower focused on:
 - Cultivation of grapevine at a vineyard for production of grapevine and/or grapevine grafts
 - Harvest of grapes, use of grapevine grafts
 - Planting and cultivation of grapevine rootstock for production of rootstock cuttings
 - Production of grapevine seedlings
- WINEMAKING is an activity focused on processing of grapes, grape mash, must and/or wine using allowed technological procedures; filling of the products into bottles, labelling of the products and their marketing.

Statistical data

- According to a registry of Central Institute for Supervising and Testing in Agriculture (CISTA):
 - Current production potential in the Czech Republic: 19,646.7 ha
 - Cultivated areas: 18,395.3 ha
 - Remaining land area:
 - Liquidated vineyards: 443.1 ha
 - Rights to renew the vineyards: 435.6 ha
 - State reserve land area: 116.3 ha
- Costs of renewing a vineyard: 500-600 thousand CZK per ha

Varieties:

- Müller Thurgau 1,975.7 ha
- Green Veltliner 1,873.9 ha
- Welschriesling 1,409.8 ha
- Rhine Riesling 1,357.3 ha
- St. Laurent 1,576.3 ha
- Limberger 1,292.8 ha
- Zweigeltrebe 866.9 ha
- Pinot blanc 860.0 ha
- Sauvignon 843.7 ha
- Chardonnay 723.9 ha

- Pinot Gris 716.1 ha
- Pinot Noir 712.1 ha
- Blauer Portugieser 676.0 ha
- Red Traminer 567.6 ha
- Neuburger 400.6 ha
- Moravian Muscat 348.9 ha
- Red early Veltliner 278.6 ha
- André 276.5 ha
- Cabernet Sauvignon 233.6 ha
- Cabernet Moravia 191.4 ha
- Pálava 144.8 ha
- Green Silvaner 144.1 ha

White wine varieties cultivated in new vineyards

- Pinot Gris 377.4 ha
- Rhine Riesling 364.7 ha
- Sauvignon 311.6 ha
- Chardonnay 241.0 ha
- Red Traminer 221.7 ha
- Pinot Gris 181.4 ha
- Müller Thurgau 142.7 ha
- Welschriesling 104.6 ha
- Green Veltliner 71.6 ha
- Moravian Muscat 57.9 ha
- Pálava 47.6 ha
- Green Silvaner 39.0 ha

Red wine varieties cultivated in new vineyards

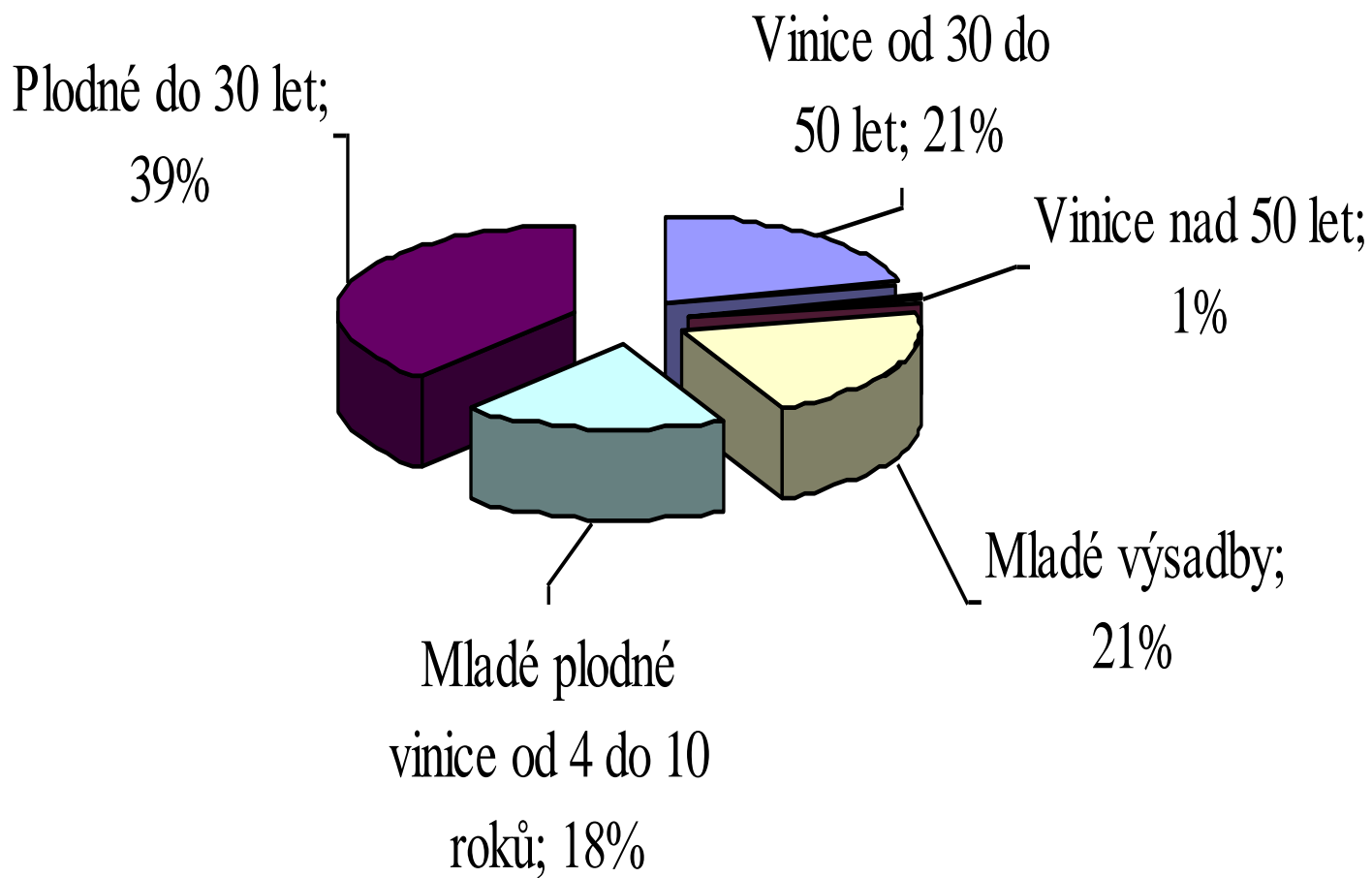
- Pinot Noir 324.7 ha
- Limberger 308.8 ha
- Zweigeltrebe 296.8 ha
- St. Laurent 205.7 ha
- Blauer Portugieser 147.2 ha
- Cabernet Sauvignon 61.7 ha
- Cabernet Moravia 56.5 ha
- Merlot 49.7 ha

Viticulture, winemaking

- Organic farming 20 ha
 - 4 businesses
- Integrated production 6,000 ha
 - 134 businesses

- Annual harvest 62,000-67,000 tons of grapes
- Yields 4.3-5.2 tons per ha
- Sugar content 19.5 °NM
- Grape consumption 4.1 kg per capita annually
- Wine consumption 20 L per capita annually
- Domestic wine production in CZ 60 million L annually
- Wine and grapes import 60 million L annually
- Wine consumption in CZ ca. 120 million L annually
 - 1 kg of grapes provides 0.7 L of wine
 - Wine consumption represents 8.8 % of total consumption of alcoholic beverages
- Wine sale (supermarkets, malls)
 - Bottles 44 %
 - Tetra pack 22 %
 - Wine in barrels 18 %
 - PET bottles 16 %

Věková struktura vinic v ČR



■ Wine Registry - under Act No. 321/2004 Sb., Central Institute for Supervising and Testing in Agriculture (CISTA) is responsible for the Registry (Dept. of Permanent Cultures, Znojmo)

■ The Registry comprises:

- A list of registered vineyards, information about the vineyards and wine growers
- Information about evaluated and listed wines, inspections of the growers, products and marketers
- Information required by the European Community

Wine origins

- Georgia and Armenia are considered to be the oldest winemaking regions in the world
- 3500 BC – excellent wine production in the regions of Mesopotamia and Egypt
- The oldest and largest vineyards were found close to today's Alexandria
- Many discoveries prove use of high technologies for wine production in ancient Greece (Crete) and Thrace (today's Bulgaria)
- Wine technology later spread to Italy, Sicily, Spain and southern France
- Wine cultivation and consumption in the CZ – probably introduced by Celts
- Origins of Czech viticulture are usually associated with ancient Romans

History of viticulture and winemaking

- The Roman Empire covered most of Europe at its height
- Grapevine cultivation and wine production were part of Roman culture
- Imported to CZ thanks to salesmen and Roman soldiers (archaeological discoveries of coins and viticultural knives)
- Significant expansion of viticulture during the Great Moravian era (9th-10th century AD)
- Monasteries played an important role in expansion of viticulture in early Middle Ages
- Brevnov Monastery – the Benedictines cultivated grapevine and produced wine since 993

- First reference in writing about vineyards in Moravia comes from 1101 – a foundation charter for Benedictine Monastery in Trebic
- Other documents prove that further development of viticulture was promoted by the Cistercian order in Velehrad (1202)
- Compact vineyard sites were established thanks to monasteries during the 13th century
- Wine became popular in early Middle Ages, and grapevine was grown in close vicinity to feudal cities and towns
- At the turn of 14th century, inhabitants of Czech lands were forced to protect the domestic market from foreign competitors
- Czech winemaking flourished in 14th century under Charles IV
- At the beginning of 15th century, wine production decreased due to the Hussite's wars

- Increase in the land area for production of wine in 15th century
- 1558, Prague teacher Jan Had, Czech academic paper called “Vineyards, Their Positioning and Management”
- 16th century – Peak wine production (Moravian winegrowers managed 20,000 ha, Czech growers 3,500 ha)
- Reign of Rudolf II – gradual decline of winemaking (overproduction of wine)
- Further development of viticulture in Moravia in second half of 16th century was influenced by immigrants from western Europe
- Import of Czech and Moravian wines increased (Moravian wine was popular in Poland in 1600)
- During the 30-year war (1618-1648) – decline in wine production (emigration of families, vineyards destroyed, abandoned)

- 100 years later – new prosperity of viticulture; most of vineyards renewed (16,616 ha)
- Wars and population decline in 17th and 18th centuries influenced Czech and Moravian wine production (vineyards not renewed; trades and commerce were more important)
- 19th century – decline was accelerated by import of foreign wines, diseases and rise of brewery
- After 1848 – intensive industry development, farmers lost interest in wine technology (efforts to change the fate – foundation of Viticultural high schools, Znojmo 1868, Valtice 1873, Melnik 1882, Bzenec 1885, Mikulov 1903)
- True disaster for European viticulture – phylloxera after 1860 (in 1890 in Satov)

- Simultaneously, powdery mildew and peronospora were imported to Europe (damage leaves and grapes)
- Chemical treatment of vineyards against phylloxera did not help; vineyards are renewed using American rootstock which is resistant to phylloxera
- New prosperity of Czech viticulture was aided by establishment of the first expert wine-oriented journal called Obzor (1906) and passage of a new wine legislation (1907)
- First World War (1914-1918) accelerated viticultural decline, land area for wine production diminished; lowest acreage in 1930
- 1960s-1984: Gradual increase in wine production area (managed by Agricultural Cooperatives)
- 1985: harsh winter, serious frost damage, many vineyards liquidated

- Quality of viticulture during totalitarian times in CZ could compete with the rest of the Europe. However, certain objections apply:
- Uniformity of wines
- The highest yields possible were the ultimate objective, often to the detriment of grape ripeness
- Excessive use of beet sugar for additional sweetening
- Grapevine varieties were considered more important than the quality itself
- Varieties were categorized into predefined quality groups; wines were produced according to the groups

PRODUCTION SIGNIFICANCE

- Grapes are cultivated for:
 - Wine production (wine grapes)
 - Direct consumption (table grapes)
 - Production of raisins

■ Wine

- Site, climate, location, soil and year all affect final flavour and quality of the wine. Wine is produced from fresh grapes by a biochemical process called fermentation. Sugars are transformed into alcohol and carbon oxides by enzymes which are extracted from the yeasts.

■ Sauser

- Sauser is a fermented must in the process of fermentation; it contains more sugar, protein and B group vitamins.

■ Wine contains:

- Alcohol (10.5-12.0 vol%, strong wines: 12-14 vol%, heavy wines: 14 vol%)
- Glycerine (glycerol makes the wine smooth and full)
- Acids (tartaric acid, malic acid)
- Tannins (tannin makes the wine bitter)

TABLE VARIETIES

- Grape cluster – individual berries connected by a stalk are called a grape cluster.
- Berry consists of a skin, flesh and seeds.
- Berry skin has various colours; red varieties contain colorants (anthocyanins) necessary for production of red wines. Skin is waxed on the outside, coating protects the berry from fungi diseases. Skin contains:
 - Tannins
 - Acids
 - Sugars
 - Aromas
- Watery flesh with 1-4 seeds is inside the berry.

Flesh contains:

- Water (55 - 87 %)
- Simple sugars – glucose, fructose (10 - 30 %)
- Organic acids - malic acid, tartaric acid (0.3 – 2.8 %)
- Pectins
- Amino acids
- Colorants
- Minerals - K, P, Fe, Ca, Mg, Na, Zn (0.5 – 2.0 %)
- Vitamins - A, B1, B2, B3, B6, B12, C, D, E

Seeds – mostly 2-3 seeds per berry. Seeds contain hydrocarbons, protein, fatty acids, tannins, aromas.

- Grapes have a positive impact on digestion, and improve gastric secretion, intestinal peristalsis, respiration and heart functioning.

RAISINS

- Energy value of raisins is 5 and more times higher than that of a fresh berry. Raisins are considered to be particularly healthy (part of cereal mixtures for breakfast; improve biological value of the food).

OTHER THAN PRODUCTION SIGNIFICANCE

■ Grapevine

- Major aspect of landscaping
- Significant role in religious and cultural rituals
- Grapevine is a constituent of a genius loci phenomenon which gives village towns their unique identities

■ Vineyards

- One of the most aesthetical cultural elements in the landscape
- Affect climate
- Landscape with vineyards combines ecological characteristics of the location with its cultural symbols

NATURAL WINE, ITS SIGNIFICANCE

- Natural wine made from grapes has accompanied humans since the most ancient times:
 - Wine quality
 - Good for health
 - Good for intellect
- Natural wine is a noble alcoholic beverage. It combines:
 - Nature
 - Genetic properties of the variety
 - Method of grapevine cultivation
 - Procedure of grape processing
- Energy value of wine is high (2,500-3,500 kJ per 1 L)

Sulphur, histamine and higher alcohols:

- Sulphur is used to protect wine from oxidation and the activity of undesirable microorganisms. Legislation allows for sulphur concentrations that have no adverse effects on human health. Histamine may temporarily have adverse effects on human health. Wine with higher levels of histamine may cause headaches, palpitations, problems with breathing, and stomach hyperacidity. Modern technologies clarify the wine (bentomit) and remove histamine along with other protein-based substances.
- In addition to ethanol, wine contains many other alcohols; if grapes are infested with grey mould, wine may contain arabitol, manitol and sorbitol.

Prevention of heart attack and stroke:

- Wine contains alcohol as well as aromas and trace elements which decrease chances of cardiovascular diseases
- Polyphenols (resveratrol), occurring only in wine, have a positive impact on human health

Wine is beneficial for gastrointestinal tract:

- Disinfection effect thanks to tannins (especially red wine)

Stimulation effects on nervous system:

- Stimulates imagination

Wine as a medicine:

- In past, wine was a part of official medical prescriptions (for diseases of gastrointestinal tract, intestines, blood, jaundice, liver and kidneys, obesity)
- Wines with higher levels of potassium steady heart functions
- Wines with higher levels of phosphor steady nervous system
- Sweet wines in general bring peace to a troubled mind – ice wines, selected overripe berries wines (the so called “vyber z bobuli”) and full-bodied red wines
- White wines with higher levels of glycerol have a laxative effect
- Haemopoiesis is promoted by wines with higher iron levels
- Red wines with high levels of tannins have a bactericidal effect
- Wines with higher levels of magnesium have an anti-allergic effect
- Wines grown on soils with high levels of lime have an alkali effect





Thank you for your
attention