

Management of coppice forests in Romania – a historical approach

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Overview

Introduction (interaction coppice systems-broadleaved tree species-rural population)

Management of coppice forests in Romania

Low coppice

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Coppice-with-standards

Short rotation coppice

Introduction

**Coppice systems-broadleaved tree
species-rural population**

Romania, country of broadleaved tree species

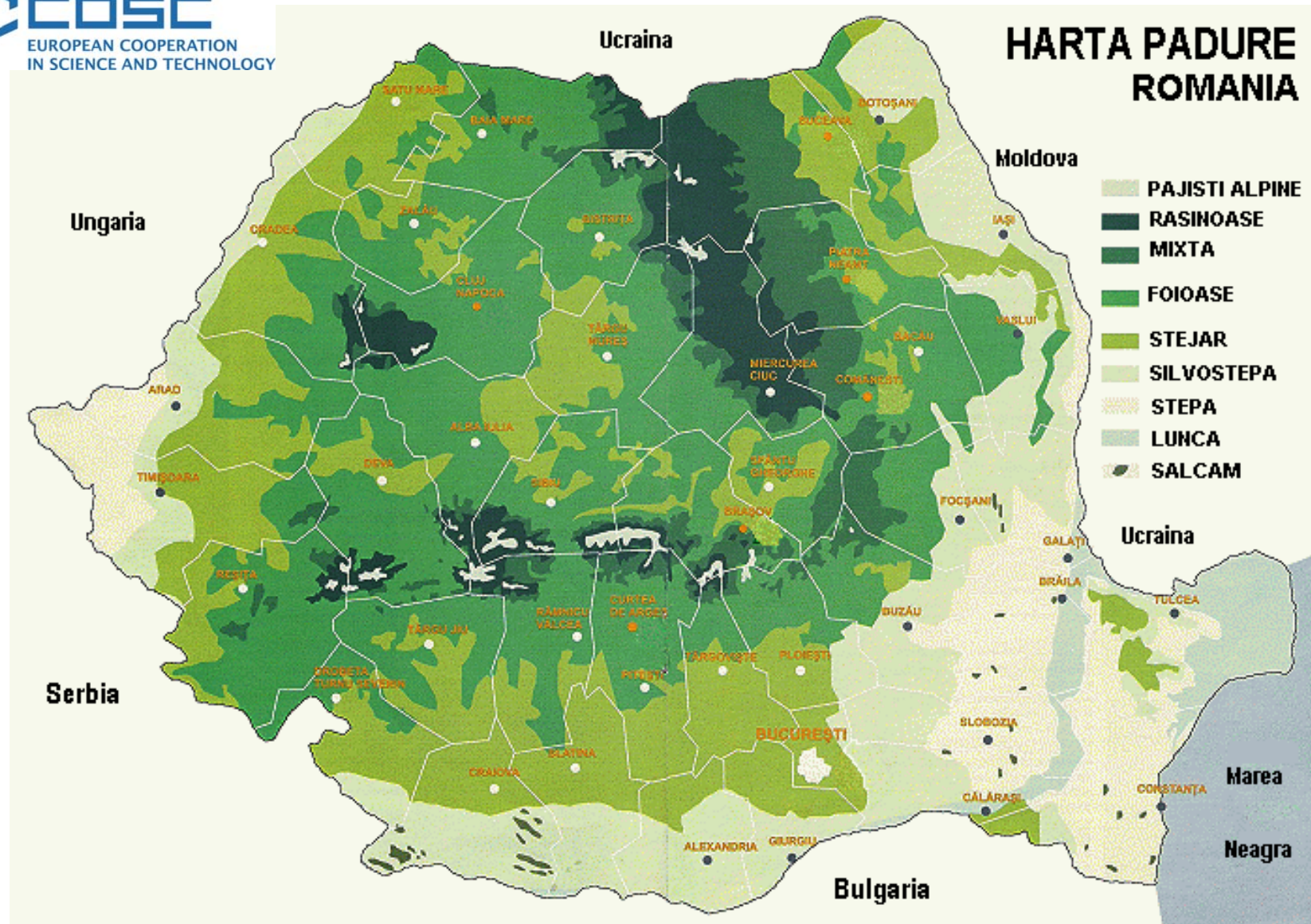
- a. **Before the major human transformations:** broadleaved tree species = 87 per cent of total national forestland.

- b. **In 1922, after the intensive exploitation of oak forests following the Treaty of Adrianople (1829):** broadleaved tree species = 78 per cent of total national forestland.

- c. **Currently:** broadleaved tree species = 75 per cent of total national forestland.

Evolution of species composition of Romanian forests

	Before the major human transformations	In 1922, after the intensive exploitation of oak forests following the Treaty of Adrianople (1829)	Currently (2015)
<i>Broadleaved tree species</i>	87	78	75
- oak forests	47	21	16
- European beech forests	21	40	29
- other broadleaved tree species	19	17	30
<i>Conifer tree species</i>	13	22	25
- Norway spruce forests	8	16	21



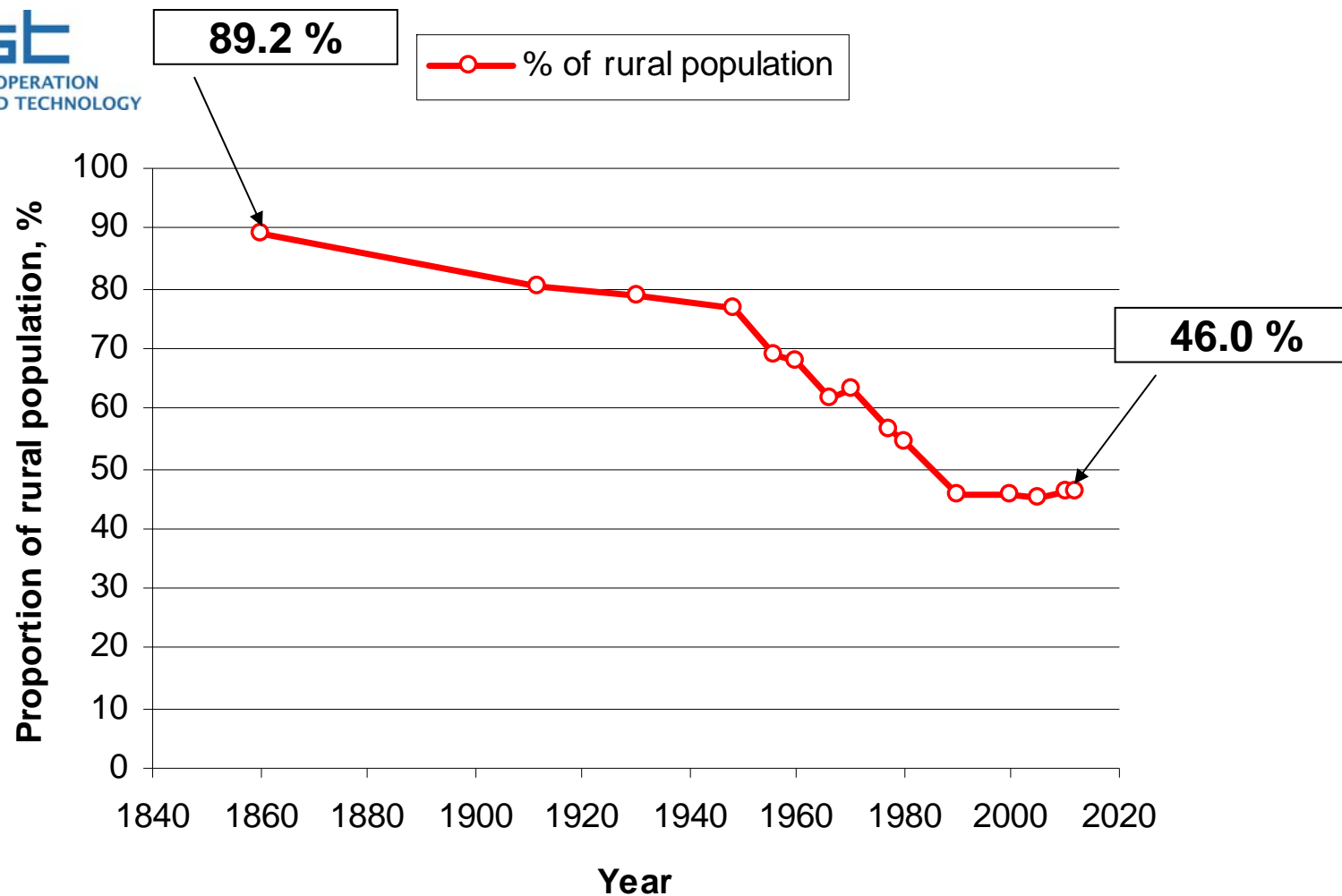
Map of forests in Romania
(from <http://www.profudegeogra.eu/harti-romania>)

Evolution of rural population of Romania since 1860

Mid-19th century: **over 89 %**

Currently: **46 %**





Dynamics of rural population of Romania between 1860 and 2012
(from Murgescu 2010, www.innse.ro, <http://enciclopediaromaniei.ro>)

Management of coppice forests in Romania

Low coppice

Main **recommendations/guidelines** related to the application of low coppice (the majority originate from the second half of 19th century-first half of 20th century)

a. Species

- the system **can be used to ALL broadleaved tree species as they have a high potential for low coppicing** (Dracea 1923). The only exceptions: European beech and silver birch (coppicing only at young ages) (Popovici 1922; Simionescu and Zeicu 1926).
- the most important species to use in low coppice: those with a low and medium quality wood, suitable especially for firewood (i.e., Turkey oak, Hungarian oak, hornbeam, black locust, field maple, field elm, alders, etc.) (Popovici 1922).





b. Rotation

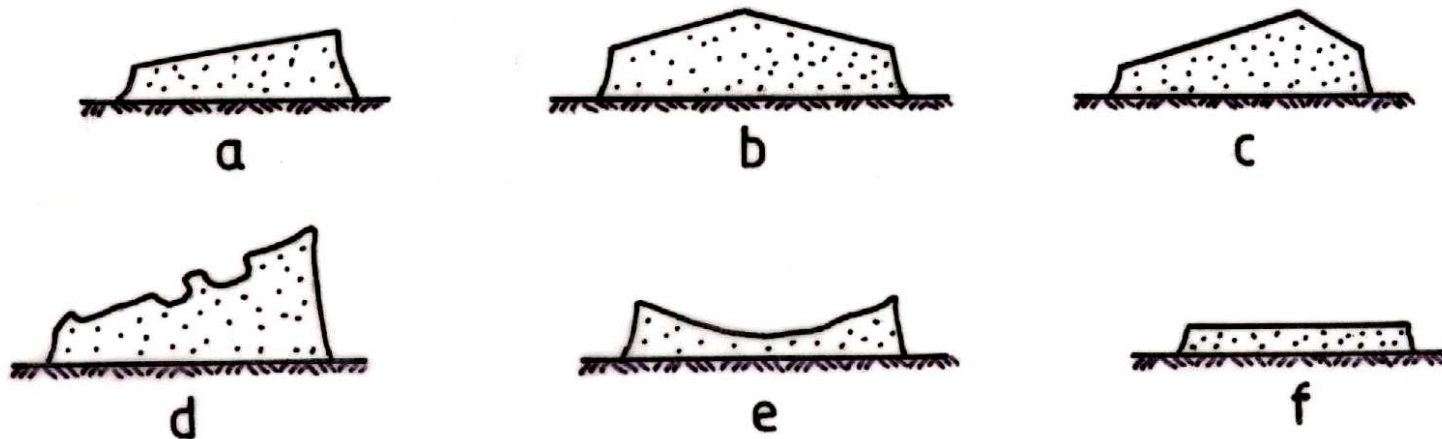
- as the majority of broadleaved tree species are able to produce stump shoots until **maximum 40 years** of age, the rotation of coppice should be no longer than this age.
- in reality, the average rotation ranged from 15 to 25 years; the only exceptions = pedunculate oak, sessile oak and black locust (30, even 35 years) (Petcut and Sburlan 1940; Drăcea 1942).
- rotation of oak coppices for tanbark production: (12) 15-20 (seldom 25) years (Dracea 1923).

c. Season of cutting

- **the optimum period** = end of winter-beginning of spring (mid-February-mid-March), after the last heavy frosts and some weeks before the onset of a new growing season (Chivulescu 1886; Popovici 1922).
- exception: oaks for tanbark production - in May-June, "when the sap flow is high" (Dracea 1923; Simionescu and Zeicu 1926).
- currently: the period for coppice cutting = 15.09-31.03 (***) 2011). 13

d. Position (method) of cutting

- as close to the ground as possible, with a smooth cut, without damaging or removing the bark below the cutting section (Popovici 1922).
- the cutting section should have either one (thin trees) or two (thicker trees) slopes, of about 20 degrees (Petcut and Sburlan 1940).



**The correct (a-c) and incorrect (d-f) way of low cutting
(from Dracea 1923)**

Area covered by low coppice forests in Romania

a. Between the two World Wars

- 1929: 1,122,443 ha (30.2% of area of managed forests) (Sabau 1931);
- 1948 (nationalization of all non-state forests): 1.9 million ha (over 30% of Romanian forests) (Costea 1989)

b. After 1950 (beginning of conversion process towards high forests)

- 1956: 25 % (Negulescu 1957)
- 1989: 5.6 % (Costea 1989)

c. After the fall of communism (1989)

- 1998: 5% (***) 1999)

d. Currently

- 4-5 %; according to the current Forest Code (2008), low coppice can be applied only to **native poplars (i.e. black, white), part of alluvial forests, willows, and black locust**
- the total area of annual low coppice cuttings = between 3,400 ha and 4,600 ha (www.insse.cms.files)

High coppice (pollarding)

I. In the past

- used for alley trees, street rows, in the railway stations and parks, for the solitary trees in agricultural lands, hedgerows, mulberry trees producing leaves for silkworm feeding (Dracea 1942).

- main use: in **floodplain white willow forests**, located along the sides of Danube River and in the Danube Delta.

- height of high stump: between (1) 2 and 3 m = 'above the highest level of floods during a long series of years' (Antonescu 1922).

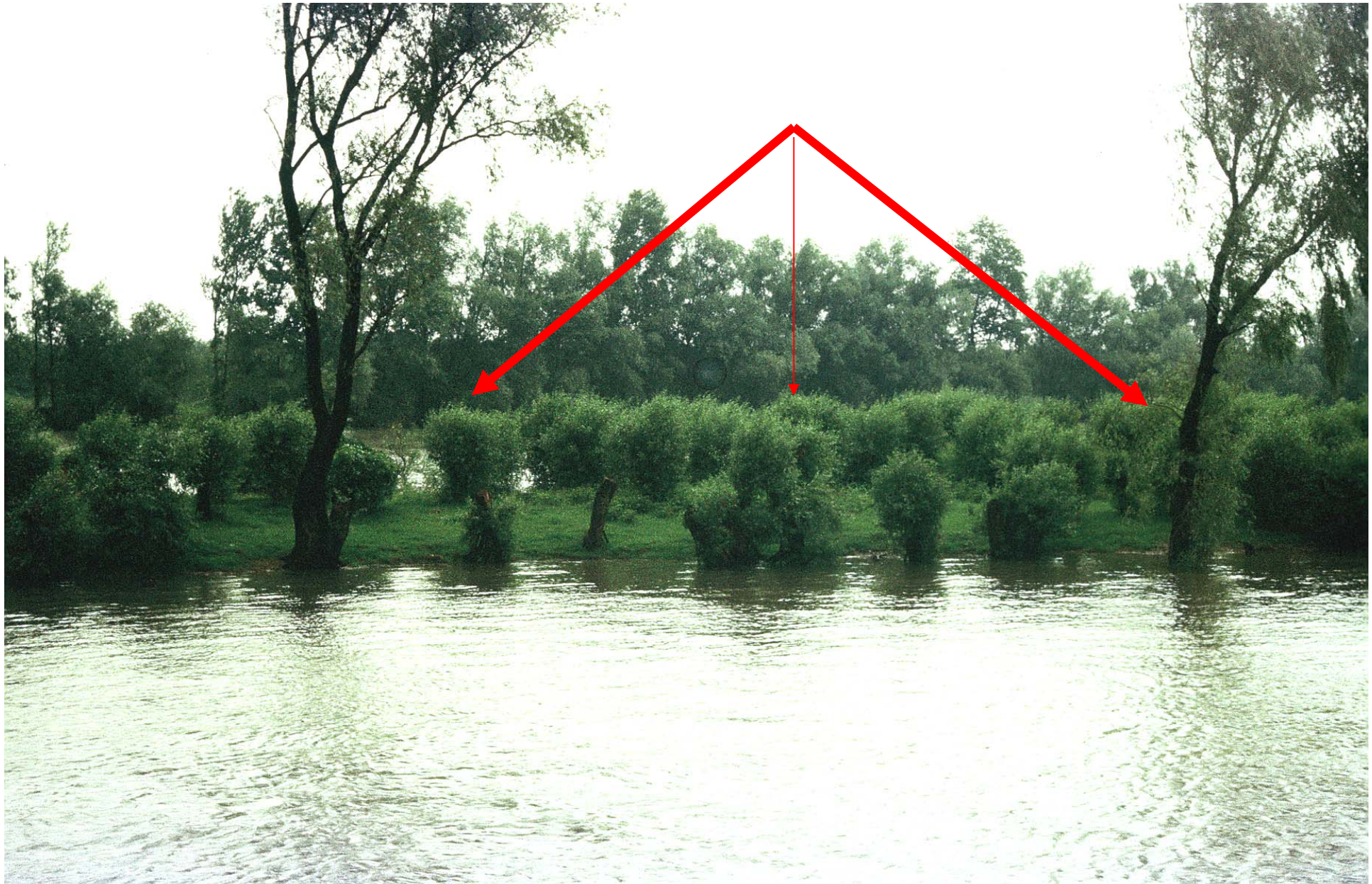
- rotations:

(1) **Until the second World War:** up to 10 years as follows:

- a. 3-5 years (Simionescu and Zeicu 1926)
- b. 4-6 years (Chivulescu 1886)
- c. 5 (seldom 6) years (Antonescu 1922)
- d. 6-9 years (Antonescu 1920)
- e. 9 years (Sabau 1937)
- f. 10 years (Dracea 1923)

(2) **After the second World War:** 10-15 years (Rădulescu and Vlad 1955)





II. Currently (provisions of *** 2000)

1. **Rotations** in white willow stands designated to sawn timber production:
 - a. 15 to 30 years (production functions).
 - b. 20 to 35 years (protection functions).
2. **Logging areas**: regular shapes, perpendicular to the watercourse. Size: maximum 10 ha. Frequency of cuttings: annual.
3. **Method of cutting**: smooth, without damaging or removing the bark below the cutting section, with a light slope.
4. **Season of cutting**: 15.09-31.03, using axes or chainsaws (*** 2011).

Coppice-with-standards (CWS)

I. In the past

- used in Moldavia since 1843 ('Pravila pentru crutarea padurilor de pe mosiile manastiresti si altele'): main provisions related to the exploitation and number (**56 trees/ha**) of standards (Danilescu 1893)

- after the Union of Moldavia and Wallachia (1859): the Moldavian system was generalized in the majority of state forests, with **maximum 80 standards/ha** and rotation of coppice of 30-40 years (Danilescu 1893).

Result of this system, 'fatal to the majority of oak forests': oak species were replaced by linden, poplars, European beech in Wallachia and by European beech in Moldavia (Danilescu 1893).



Historical provinces of Romania
(from <https://understandhistorynow.wordpress.com>)

Other problems/mistakes (Danilescu 1893; Antonescu 1910; Drăcea 1920):

- late beginning of conversion of low coppices towards CWS (middle-aged stands, up to 50-60, even 100 years old).
- too long coppice rotations (up to 35-40 years).
- too many coppice cycles, without removal/replacement of old and exhausted stumps.
- too many standards, sometimes of undesired tree species such European beech or hornbeam.
- standards not prepared for the conversion towards CWS = dieback of the tip then of the whole tree.
- standards not tended by removal of epicormic branches.

After 1881: CWS expanded to the hill and plain areas of Romania, with up to 100-140 standards/ha (Drăcea 1920).

Main application of CWS: between 1870 and 1895; after 1900 a less important application, but still over 450,000 ha.

- 1928: 229,104 ha (3.5% of national forestland) (Ionescu 1930).

Unfortunately, since the beginning of its application in RO, the CWS has been used in its simplest form, with only two cohorts of standards (Fr. *taillis au reserve*), never achieving the ‘full form’, with 4-5 cohorts of standards.

After 1948:

- **NO** further application of coppice-with-standards allowed, all CWS being converted towards high forests.

II. After the fall of communism

- **NO** formal/legal return to CWS has been allowed by the forest legislation, even though over 50% of Romanian forests are non-state owned nowadays...



Short rotation coppice

- mostly using willow cuttings (imported from Sweden, partially via Hungary).
- started after 2005.
- until 2010: only test plantations in different parts of the country.

Currently:

- over 800 ha of willow energy cultures (as well as about 1,000 ha of poplar energy cultures).
- best results: W and SW of Transylvania (Banat region, about 400 ha), north of Moldavia, Danube Delta.



Thanks for your attention!