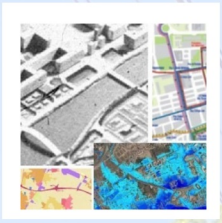

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Determination of CO_2 stored by fruit trees in Craiova, Romania cityscape

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Vegetation is vital for the sustainability of cities, considering the fact that there are numerous sources of pollution in the urban environment, being also able to store CO_2, thus the phenomenon of CO_2 absorption by plants, during photosynthesis, is the main way through which carbon is stored in the biosphere. The concentration of CO_2 in the atmosphere increased by 22% between 1960 and 2007, and climate models predict that it may double by 2100, with an annual increase rate of 0.5% CO_2.

MATERIALS AND METHODS

In order to determine the amount of CO_2 stored by fruit tree species in the urban environment of Craiova, the following species were studied: an alignment of 6 species of *Prunus cerasifera*, a group of 4 species of *Ficus carica* and solitary specimens of *Cornus mas, Juglans regia, Malus domestica, Persica vulgaris* and *Morus nigra*. For each species, a series of measurements were taken: tree height, trunk height and diameter, maximum and minimum crown width, distance to buildings, street or fences, building height, and distance to the nearest form of vegetation. To determine the annual amount of CO_2 that can be stored, the online platform "Lifeclivuttreedb" was used, created within the project "The Life Clivut Climate Value of Urban Trees", funded by LIFE, an instrument of the European Union for environ-ment and climate action , with the objective of arranging and managing urban green spaces by increasing resistance to climate change.

RESULTS AND DISCUSSION

Average estimates of CO_2 accumulation can be found in Table 2, starting from the current stage of development of the fruit species, then being calculated every 5 years, over a period of 50 years. At this moment, we notice that the solitary walnut, stores the most carbon dioxide, 1.92 tons annually, having a height of over 10 m, while the less vigorous walnut, with a about 2 m high, stores only 0.06 tons of CO_2.

High values of carbon dioxide absorption in 50 years, respectively 3.05 and 2.99 tons of CO_2, were also recorded by the group of four figs, often found in private gardens. It is the 3rd species, which at the current stage, recorded a high rate of CO_2 absorption, after walnut and mulberry, recording the values of 0.30 and 0.26 tons, with heights between 3.6 - 3.9 meters.

Table 2. Average CO_2 accumulation (tons) of fruit trees at the current stage and in the coming years

	CO_2 in the current stage	CO_2 + 5 years	CO_2 + 10 years	CO_2 + 15 years	CO_2 + 20 years	CO_2 + 25 years	CO_2 + 30 years	CO_2 + 35 years	CO_2 + 40 years	CO_2 + 45 years	CO_2 + 50 years
Prunus cerasifera 1	0.12	0.21	0.30	0.39	0.48	0.57	0.65	0.74	0.83	0.91	0.99
Prunus cerasifera 2	0.08	0.17	0.27	0.36	0.45	0.54	0.62	0.71	0.79	0.88	0.96
Prunus cerasifera 3	0.08	0.17	0.27	0.36	0.45	0.54	0.62	0.71	0.79	0.88	0.96
Prunus cerasifera 4	0.21	0.30	0.39	0.48	0.57	0.65	0.74	0.83	0.91	0.99	1.07
Prunus cerasifera 5	0.08	0.17	0.27	0.36	0.45	0.54	0.62	0.71	0.79	0.88	0.96
Prunus cerasifera 6	0.23	0.32	0.41	0.50	0.59	0.67	0.76	0.84	0.93	1.01	1.08
Ficus carica 1	0.30	0.52	0.77	1.02	1.28	1.54	1.81	2.10	2.40	2.72	3.05
Ficus carica 2	0.26	0.47	0.72	0.97	1.23	1.49	1.75	2.03	2.34	2.66	2.99
Ficus carica 3	0.26	0.47	0.72	0.97	1.23	1.49	1.75	2.03	2.34	2.66	2.99
Ficus carica 4	0.26	0.47	0.72	0.97	1.23	1.49	1.75	2.03	2.34	2.66	2.99
Cornus mas	0.01	0.10	0.19	0.28	0.37	0.46	0.55	0.64	0.72	0.81	0.89
Juglans regia 1	0.06	0.13	0.22	0.32	0.56	0.79	1.07	1.36	1.67	1.98	2.31
Juglans regia 2	1.92	2.24	2.57	2.87	3.16	3.43	3.69	3.89	4.08	4.20	4.31
Malus domestica	0.19	0.25	0.32	0.40	0.48	0.58	0.69	0.81	0.94	1.06	1.18
Cerasus vulgaris	0.17	0.27	0.36	0.45	0.54	0.625	0.71	0.79	0.88	0.96	1.04
Persica vulgaris	0.01	0.10	0.19	0.28	0.37	0.46	0.55	0.64	0.72	0.81	0.89
Morus nigra	0.84	1.07	1.31	1.57	1.85	2.14	2.45	2.77	3.09	3.42	3.74

CONCLUSION

Referring to the carbon dioxide absorption capacity that fruit tree can have in public and private green spaces in the urban environment, **we observe species such as walnut, mulberry and fig, with a high storage power, thus indicating their use in the new landscaping, but also the preservation of existing specimens in the urban environment.** Species with a lower absorption potential can also contribute to increasing biodiversity in the urban environment, but also to increasing the aesthetic effect. **The development of modern technology has led to the implementation of such platform, accessible to everyone, being indicated for landscapers or horticulture specialists to use it, increasing the quality of the design process and developing new ways of thinking regarding sustainable cities.** Green infrastructures in the urban environment have a crucial role in mitigating climate change, the study forming a vision of the ecological potential offered by fruit tree.