

Terminological glossary: A sample of phytopathology in fruit plants

Ioneide Negromonte de Vasconcelos Rocha

PhD in Linguistic Studies from São Paulo State University “Júlio de Mesquita Filho” (IBILCE-UNESP), São Paulo, Brazil and professor at Faculties Magsul (Famag) and Integrated Faculties of Ponta Porã-MS (FIP / MAGSUL), Mato Grosso do Sul , Brazil

E-mail address: ioneidenegromonte@homail.com



*Corresponding Author

* Ioneide Negromonte de Vasconcelos Rocha

PhD in Linguistic Studies from São Paulo State University “Júlio de Mesquita Filho” (IBILCE-UNESP), São Paulo, Brazil and professor at Faculties Magsul (Famag) and Integrated Faculties of Ponta Porã-MS (FIP / MAGSUL), Mato Grosso do Sul , Brazil

*Author Email:

ioneidenegromonte@homail.com

Abstract

This work is based on foundations of lexicon studies, with a focus on the area of Terminology, which studies the languages of specialty or a vocabulary set of an area of knowledge. The purpose of this study is to investigate terms related to the phytopathology of fruit plants and to elaborate a terminological glossary of this area, in order to guide more clearly the process of building the knowledge of young academics during the undergraduate course in Agronomy. Since phytosanitary, an area where phytopathology is found, represents a necessary field of knowledge for the academic formation of the undergraduate student. This work, therefore, results in a glossary in the form of a sample of 18 (eighteen) terms about phytopathology of fruit plants, which will also contribute to the communication of non-specialists, academics in training in the Agronomy course.

Keywords: Terminology. Phytopathology. Fruit growing. Agronomy Students.

Introduction

The language means a more effective communication mechanism in the human relationship. It is through it that the culture, the values and the way of a people to understand the world are revealed. Communication, in turn, is what the individual needs, not only for their relationship with others and interaction in society, but also for their own subsistence in the environment in which they live.

From this perspective, synchronous language studies are relevant, as they allow the researcher to verify the transformation processes, whose objective is to present its functioning in a systematic way. For this reason, this article is based on the foundations of Lexicon studies and takes up theorists who dealt with aspects of Terminology. The terminology analysis sample is linked to the large area of Agrarian Sciences, specifically to the phytopathology of fruit plants, with the purpose of explaining a sample of terms,

through a terminological glossary, with the purpose of guiding the understanding of the language of specialty in the knowledge building process of young academics of the undergraduate course in Agronomy.

Phytopathology - a branch of plant health - is a word of Greek origin - Phytos = plant; Pathos = diseases and Logos = study - means the science that studies plant diseases, involving various aspects such as diagnosis, symptoms, etiology, epidemiology and even the control of these diseases. During the knowledge processes in the undergraduate course in Agronomy, academics are faced with the terminology of diseases in plants that do not configure, at first, understanding for a general language speaker, since they know (or not) only the denominations to from common sense.

Thus, this work stems from previous linguistic studies carried out by this author, in the area of agrarian sciences and in a very promising region with regard to the rural countryside, in the city of Dourados in the state of Mato Grosso do Sul, Brazil. Region where it is common to find farmers who own small to large rural areas.

That said, this article presents a sample of 18 terms related to Phytopathology. With foundations by authors from Terminology, Phytopathology, general language dictionaries and other equally important scholars. It is believed that the results of this study can contribute effectively to the construction of the knowledge and communication process of young academics from the undergraduate course in Agronomy.

Terminology in the area of phytopathology

Terminology is a science that studies the languages of specialty or a vocabulary set of an area of knowledge. The object of study of terminology consists of a "set of terms for a domain and the concepts (or notions) designated by them". (BARROS, 2004, p. 34). This object results in the construction of specialized dictionaries or glossaries of a specialized area, which is defined as lexicographic works. In the case of term lexicography, it is called terminography, which registers the language of an area of science, in the case of this article, phytopathology in the Agronomy course.

This type of study is not recent, as there are reports that terminological dictionaries have existed since antiquity. It can also be said that since man discovered language because, from that domain, he started to name objects, animals, plants, work tools and the entire environment around him, even for a need to survival.

It appears that the man already perceived the need to refer to a specific field of words that designate elements of the same area of knowledge. This attitude, in the beginning, shows with evidence the study of Terminological Science. It is worth mentioning that the term means a lexical unit with a specific content load within a knowledge area. Thus, the term is also called a terminological unit.

According to some experts, terminology studies were developed in the former Soviet Union, by Eugen Wüster (1898-1977), when he presented his doctoral thesis and

developed the General Theory of Terminology. In 1931, Wüster published a book based on developed studies, *Die internationale Sprachnormung in der Technik*. Wüster's proposal, in terminological studies, was the univocity between concept and term, that is, a single term can designate a concept. The work aimed to eliminate ambiguity in speeches by specialists. For him, there is no polysemic term, synonymous or homonymous.

Wüster was concerned with eliminating ambiguity in technical discourses, but he was ambiguous in relation to linguistics. He was interested in the term, far from the lexicon of grammar; he dissociated content and expression, which clashed with Saussure's linguistic theories.

From another perspective, the sciences in general mature and limitations are observed. So, starting in 1990, this was what happened with the General Theory of Terminology. And in this reflective process, the need for a new theoretical-methodological proposal for terminology was realized. That is why Maria Teresa Cabré's Communicative Theory of Terminology was born. She respects Wüster's theory, recognizes the value of the proposed model, but knows that specialized knowledge must not be dissociated from languages and culture.

The Terminology Communicative Theory admits the term as a linguistic unit. Even in the area of specialty, the term is still a sign. Cabré also recognizes the existence of conceptual and denominational variation, so he takes into account the textual and discursive dimension of the term. According to Barros (2004, p.5), "These are linguistic units that must be considered in a polyhedral perspective, that is, in their linguistic, cognitive and social aspects".

The new theory proposed by Cabré focuses on a communicative scope of language, more specifically on linguistic signs in fields of specialties. This new vision promotes advances in terminology studies.

As for phytopathology, it is the science dedicated to the study of phytomolesties in their cause, characteristics, evolution and management. According to kimati (2005), it can be divided into General Phytopathology, which studies the principles, concepts and techniques; Special, which studies the various diseases grouped according to nature or according to the plant. This area gained visibility as a science in the middle of the 19th century.

Although it is a recent science, its content is old, since the planting of food for the survival of man is nothing current. It is probable that man, when establishing himself and promoting agriculture as a source of food for his survival, faced problems with damage to crops due to pests or diseases. Plantation diseases are mentioned in the Bible, but it was a time when negative situations for the population were related to divine punishment or some mystical cause. Today, diseases are dealt with in a physiological way: plant and disease.

In this sense, it is perceived that phytopathology represents an important factor to subsidize the agricultural production process, since it also aims to solve problems related to the appearance of diseases, which harms farmers

so much in the reduction and quality of the harvested products.

From the perspective of the Communicative Theory of Terminology, in this article there is a sampling of terms that belongs to the specialty area of phytopathology in order to contribute to better understanding and communication regarding the use of terms in the academic community.

Methodology

The purpose is to present 18 terms about phytopathology, whose analysis is aimed at fruit plant diseases. These problems are presented in alphabetical order and follow a terminological form that conditions the organization of the text of the microstructure of each term, that is, each entry word in the glossary.

The terms were collected from a specialist magazine in the field entitled Coletânea Sítio & Cia Especial 01, 2008, which contains a set of three magazines: numbers 02, 03 and 04, whose number 02 corresponds to Pomar. The magazine features reports of plants grown as fruits: pineapples, acerolas, bananas, guavas, oranges, passion fruit, strawberries, peaches, which served as references for the analysis of terms in the field of phytopathology. It was

also concerned with presenting, in the concept, the name of the fruit plant or the fruit affected by the disease, since it is also possible to find the name of the same disease in other fruits, vegetables, cereals, but with another scientific name or other symptoms in the plant.

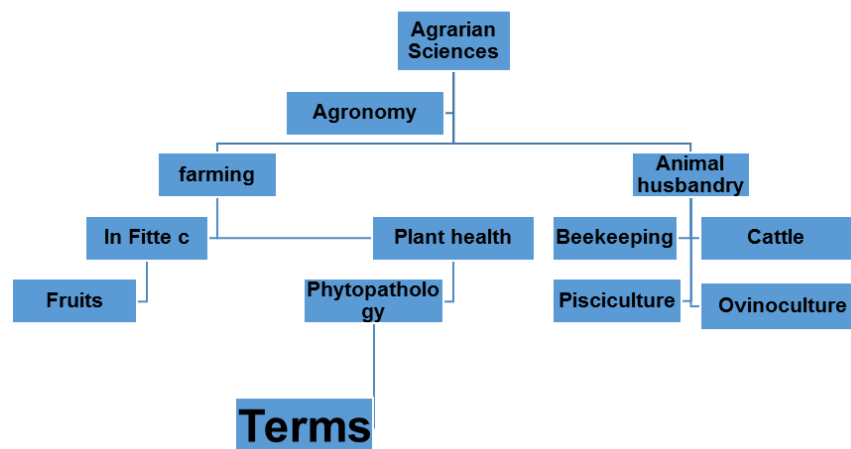
In each report of the respective fruit culture, one or two diseases (s) were extracted so that it could be analyzed, thus becoming: for the pineapple, eye rot; for acerola, warts; for the banana, yellow sigatoka, black sigatoka and panama mal; for guava, bacteriosis and rust; for the orange tree, citrus canker, leprosis, sudden death, black spots and sadness; for passion fruit, anthracnose; for strawberry, black flower, angular spot, miscoferela spot and Diplocarpon spot; for peach, brown rot.

For the construction of the glossary of terms, a form will therefore be presented for the textual organization of the microstructure of each input word and, next, the conceptual map of Agrarian Sciences and where the area of Phytopathology is located. In the terminology form, some term may not have all the suggested elements, but the sequence remains the same. Abbreviations will only appear in morphological class followed by gender and the acronym of the term. Thus, the informative sequence of the text of each term is:

Terminology Sheet

Term:
Scientific term name:
Morphological class followed by gender:
Initials:
Popular variant:
Definition:
Context:
Synonym:
Remissive:
Note:
Source / year:

Conceptual map



Sample of terms related to phytopathology in fruit plants

1. Fruit anthracnose - *Colletotrichum gloeosporioides*. s.f. Disease caused by the fungus *Glomerella cingulata*. It attacks leaves, branches and fruits. It causes, in the leaves of the passion fruit, light spots with dark green edges and soon changes to dark brown. In the center of the lesion, necrosis occurs. In the branches, the lesions cause the defoliation and death of the pointers. In the fruits, the infection appears in the form of soft rot, and then the fruit falls. The disease is spread by seeds, rain splash, insects and agricultural implements. "Diseases and pests that compromise the production of passion fruit ... The most common diseases are anthracnose, fusariosis and bacteriosis caused by *Xanthomonas* spp." (Coletânea Sítio & Cia Especial, 2008 p.46). Stain, rot.

Note: The fungus survives in cultural remains and infected tissues in the plant itself. (Manual of Phytopathology, 2005 p. 470).

2. Bacteriosis - *Erwinia psidii*. s.f. Disease caused by bacteria. The infection affects the leaves and branches of the guava in the region of the pointer, causing the "drought of the pointers"; the plant does not die, but there is considerable damage to fruit. The bacterium benefits from high temperature and humidity conditions. The disease is spread by infected seedlings, pruning tools or injuries. "According to Cláudia Dolinsk, professor at the State University of the North of Rio de Janeiro, Darcy Ribeiro (UENF), the main diseases that attack fruits are rust and bacteriosis". (Coletânea Sítio & Cia Especial, 2008 p. 58).

Note: Flowers and young fruits are also affected, becoming darkened, drying out and becoming mummified. (Phytopathology Manual, 2005, p. 401).

3. Citrus cancer - *Xanthomonas axonopodis* pv *Citri*. s.f. Contagious disease caused by bacteria. It causes eruptive, cortical, slightly protruding, punctate, cream or brown colored lesions; it causes lesions in leaves, fruits and branches, when more aggressive it causes the fall of leaves and fruits. The disease is transmitted mainly by man, through the transit of people in orchards, harvest materials, vehicles, and seedlings. "Leprosis, citrus canker, sadness, black spots and sudden death are some diseases that affect citrus plantations". (Coletânea Sítio & Cia Especial, 2008 p. 33)

Note: There is a wide variability in the levels of disease resistance between species, hybrids and

varieties of citrus and related genera. (Phytopathology Manual, 2005, p. 249-250).

4. Rust - *Puccinia psidii*. s.f. Disease caused by parasites. Causes lesions on the leaves of the guava tree in a circular shape and brown color. The flower buds or fruits are necrotic and black in color. The disease is spread through the wind. Dew is crucial for new infections and the production of uredinospores. According to Professor Cláudia Dolinsk (UENF), "the main diseases that attack fruits are rust and bacteriosis". (Coletânea Sítio & Cia Especial, 2008, p. 58)

Note: Guava rust is a typically polycyclic disease, causing several outbreaks of the disease in the same agricultural year, with the presence and youthful tissue in a period of moderate temperature and high relative humidity. (Manual of Phytopathology, 2005, p. 402).

5. 5. Black flower - *Colletotrichum acutatum*. s.f. Disease caused by fungus. It attacks the aerial part of the plant by natural opening or injury to the strawberry. It causes the death of the tips, accompanied by necrosis and death of fruits and young budding. In goblets, the stains have a dry appearance. The disease is transmitted over a long distance by infected seedlings; already at a short distance, by pruning shears, in addition to insects, rain and wind "... with drip irrigation, they help prevent diseases that attack the aerial part of the strawberry tree, such as the black flower, mycosferela spots, diplocarpon and angular". (Coletânea Sítio & Cia Especial, 2008, p. 20) Leaf spot, death of the tips.

Note: The black flower is one of the most destructive diseases of the strawberry. It is widely distributed in all producing regions, causing severe damage, due to the susceptibility of the varieties in use. (Phytopathology Manual, 2005, p. 493).

6. Citrus leprosis - *Citrus leprosis virus*. s.f. CILV. Disease caused by a virus transmitted by the mite *Brevipalpus phoenicis*. The virus causes symptoms in the leaves, with the appearance of rounded and smooth lesions, which in large quantities cause the leaf to fall; in the new branches, the lesions are yellowish, then reddish brown, they become scaly and with thick skin, also causing the branches and fruits to dry out. It is disseminated by factors that favor the mite population increase, regions or plants with water stress, fruits with wart lesions and leaves with citrus larvae attack serve as a shelter for the mite. "Leprosis, citrus canker, sadness, black spots and sudden death are some diseases that affect citrus plantations". (Coletânea Sítio & Cia Especial, 2008, p. 33)

Note: Because it is very polyphagous, leprosis mites are present in numerous host plants, among weeds and hedges in citrus groves, which favor their multiplication and dissemination. (Manual of Phytopathology, 2005, p.244).

7. Panama mal - *Fusarium oxysporum* f. sp. Cuban. s.f. Disease caused by fungus. It causes yellowing of the banana leaves, followed by withering, drying and breaking. It is reddish-brown in color. The disease is transmitted by roots and pseudostem of sick plants, which release a large amount of inoculum on the soil surface and irrigation, drainage and flood water, animals, men, equipment and infected planting material. "Panama mal *Fusarium oxysporum*: the plant ... It looks like a closed umbrella. (Coletânea Sítio & Cia Especial, 2008, p. 15). *Fusarium* stain or banana *Fusarium* stain.

Note: The symptoms exhibited by plants attacked by fusariosis can be observed externally and internally. (Phytopathology Manual, 2005, p.110).

8. Angular spot - *Xanthomonas fragariae*. s.f. Disease caused by bacteria. It causes small soggy spots on the strawberry leaves, becoming oily and soon the affected tissue becomes necrotic and dark. They are angular contours delimited by major ribs, which, when it reaches the secondary, causes the leaf to dry out. The disease is spread by the bacterium penetrating through stomata and rainwater or sprinkler irrigation. "... with drip irrigation, they help prevent diseases that attack the aerial part of the strawberry plant, such as the black flower, spots of mycosferela, diplocarpon and angular spot". (Coletânea Sítio & Cia Especial, 2008, p. 20)

Note: In addition to the leaf blade, petiole and penduncle may have dark brown lesions. In goblets, the spots are similar to those on leaves, often in association with symptoms caused by other pathogens. (Manual of Phytopathology, 2005, p.492).

9. Miscoferela stain.- *Mycosphaerella fragariae*. s.f. Disease caused by fungus. Reduces the photosynthetic area in the strawberry leaves. Initially, gray spots appear that can reach the entire leaf area and culminate in the dryness of the leaf. There are still losses to fruit production and quality. The disease is transmitted by excess moisture. "... with drip irrigation, it helps to prevent diseases that attack the aerial part of the strawberry tree, such as the black flower, spots of mycosferela, diplocarpon and angular spot". (Coletânea Sítio & Cia Especial, 2008, p. 20)

Note: The infection is favored during all stages of the culture. Old leaf lesions serve as a source of inoculum. Temperatures between 20 and 25°C are considered optimal for infection and the development of symptoms. (Manual of Phytopathology, 2005, p.492).

10. Diplocarpon stain - *Diplocarpon earliana*. s.f. Disease caused by fungus. It causes, in the older leaves of the strawberry, irregular spots of homogeneous purple color. In petioles, peduncles, stolons and fruits reddish lesions with an elongated shape can occur. In the goblets, the spots have a dry appearance and detract from the quality of the fruit. The disease is spread by rainwater, temperature between 20 and 25°C. "... with drip irrigation, it helps to prevent diseases that attack the aerial part of the strawberry tree, such as the black flower, spots of mycosferela, diplocarpon and angular spot". (Coletânea Sítio & Cia Especial, 2008, p. 20). Leaf spot

Note: As with *Mycosphaerella*, the fungus remains from year to year, among us, in its imperfect phase. (Phytopathology Manual, 1980, p. 393)

11. Sudden death of citrus - s.f. MSC. It is a disease caused by the crown / graft combination. Scholars suspect it is caused by an airborne virus. The sudden death of citrus causes a decrease in the size, weight and quantity of fruits. The disease is transmitted by grafting bubbles from diseased plants to seedlings in pots protected from insects. "Leprosis, citrus canker, sadness, black spots and sudden death are some diseases that affect citrus plantations". (Coletânea Sítio & Cia Especial, 2008, p. 33)

Note: The characteristic symptom of the disease, which has allowed its diagnosis, is the presence of an intense color, tending to orange, in the internal tissues of the rootstock bark below the grafting zone ... (Manual de Fitopatologia, 2005, p. 242).

12. Black spot or black spot- *Guignardia citricarpa*. s.f. MPC. Disease caused by the fungus. It causes damage to both the leaf and the citrus fruit. On the leaf, gray colored lesions and protruding edges. In the fruit, black and numerous lesions. MPC disease - citrus black spot - is favored by intense solar radiation and high temperatures. "Leprosis, citrus canker, sadness, black spots and sudden death are some diseases that affect citrus plantations". (Coletânea Sítio & Cia Especial, 2008, p. 33). False melanosis, black spot, grimace.

Note: The incubation period is very long, and in some conditions it may be longer than one year. (Phytopathology Manual, 2005, p.261)

13. Rey-of-the-eye - *Phytophthora nicotianae*. s.f. Disease caused by fungus. It causes changes in the new leaves of the pineapple, the color changes to dull yellow and gray and then lesions that spread. It reaches the stem and promotes the decay and death of the plant's eye. The disease is transmitted by a parasite that lives in the soil, which acts in the periods after planting and floral induction. "The main diseases and nematodes can be prevented ... Pests must be monitored and controlled when necessary. The most common are: white cochineal and fruit borer pests and fusariosis (or gummosis) and eye rot diseases". (Coletânea Sítio & Cia Especial, 2008, p. 27). Parasitic *Phytophthora*. Top rot.

Note: Pineapple eye rot is caused by *P. nicotianae*, and can sometimes also be caused by *P. cinnamomi*, *P. nicotianae* occurs mainly when in temperatures above 25°C. (Phytopathology Manual, 2005, p.13).

14. Parda Rot - *Minilinia fruticicola* s. f. Fungus disease. It causes damage to the peach tree in the branches, flowers and decreases the quantity and quality of production. The disease is spread by the wind, and, after germination, penetration occurs through floral organs and also insects. "The most common problems in peach cultivation are pests and diseases. Grapholite (oriental moth), fruit fly and dust mites can end peach production. Rust and brown rot are also aggravating". (Coletânea Sítio & Cia Especial, 2008, p. 64). Fruit rot

Note: Typical and most economically important symptoms appear in ripe fruits. (Phytopathology Manual, 1980, p.445)

15. Yellow sigatoka - *Mycosphaerella musicola*. s.f. Disease caused by fungus. The disease causes necrosis in the banana leaf in the form of stretch marks. It starts with a slight discoloration, which soon increases, forming a yellow streak and then black spots. It is disseminated by high humidity and poorly ventilated soil, with low pH and phosphate content. "Yellow Sigatoka ((*Mycosphaerella musicola*): burns the leaves and interferes with the production of fruits." (Coletânea Sítio & Cia Especial, 2008, p.15). *Pseudocercosporium* sp.

Note: The disease incubation period is quite long; the first symptoms appear about two weeks after penetration and the necrotic spot reaches its characteristic appearance 2 weeks later. (Phytopathology Manual, 1980, p.89)

16. Black sigatoka - *Mycosphaerella Fijiensis*. s.f. Disease caused by fungus. It attacks banana leaves with lesions similar to those of the yellow sigatoka. Infection occurs in the youngest leaves. Initially, streaks of brown color appear, evolving to black streaks. There is a rapid destruction of the leaf area, reducing the photosynthetic and productive capacity of the plant. The disease is spread, through the wind, by the spores that take shelter in old leaves. "Black sigatoka (*Mycosphaerella Fijiensis*): it is like the yellow sigatoka, only more violent". (Coletânea Sítio & Cia Especial, 2008, p. 15) *Mycosphaerella Fijiensis* var. *difformis*; *cercospora Fijiensis*. Black sigatoka.

Note: The black sigatoka was first described in 1963, in the Fiji Islands, Sigatoka district, and was initially called the black stria. (Manual of Phytopathology, 2005, p.108).

17. Sadness - Citrus sadness virus. s.f. CTV. Disease considered to be a virus. The sadness virus is of the genus closterovirus. In plants it causes the appearance of flutes in the branches and trunk (a kind of streak in the stems), stunting, Zn deficiency and small fruit production. The disease is transmitted by different species of aphids and mainly by the black aphid, *Toxoptera citricida*. "Leprosis, citrus canker, sadness, black spots and sudden death are some diseases that affect citrus plantations". (Coletânea Sítio & Cia Especial, 2008, p. 33)

Note: CVT is limited to phloem and can be easily transmitted by grafting and, experimentally by *Cuscuta* and by phloem injury. (Phytopathology Manual, 2005, p.241).

18. Warts - *Cladosporium herbarum* and *Sphacelomasp.* s.f. Disease caused by fungus. It attacks the leaves, fruits and young branches of the aceroleira (*Malpighia emarginata*). Roughness appears on the leaves, sometimes accompanied by ribs. On the fruits, roughness appears, which causes distortion and atrophy. In the new branches there is deformation. The disease is spread by rainwater and wind. "If the orchard of aceroleiras is not carried out properly, it may suffer attacks from pests and diseases ... According to Araújo, the most common are nematodes, aphids, mealybugs, cercosporiosis and warts". (Coletânea Sítio & Cia Especial, 2008 p. 51)

Note: Symptoms of infections caused by *C. herbarum* can be seen in flowers, flower buds and young fruits. (Phytopathology Manual, 2005, p.16).

Final considerations

It is important for the general population to build a dictionary of specialized areas, since general dictionaries cannot cover all or even half of what is sought in areas of science. As a result, the most widely used dictionaries of general language were consulted by consultants such as Ferreira (1999) and Houaiss; Villar (2001), as they are also the best known by society.

Of the 18 terms presented in the field of phytopathology, only 5 (five) appear in the dictionaries, yet without many specifics. The records were found in the dictionaries consulted: anthracnose, without specifying that they belong to citrus; bacteriosis; cancer, without specifying that they are citrus; rust and brown rot. Despite the small sample presented here, there is still a much smaller sample for consultants in specialized areas.

Therefore, the concern in the analysis of the terms of phytopathology and in the construction of the terminological glossary was that especially the concepts attributed to the terms could serve to reduce the difficulties of linguistic comprehension during the process of building knowledge of young scholars of the Agronomy course in the discipline of phytopathology.

This reinforces the need and importance of building dictionaries and glossaries in the areas of specialties so that academics can have quick access to their area of knowledge and also facilitate the construction of knowledge for future professionals.

References

- ALVES, by Ieda Maria et al. (2001). Glossary of neological terms of economics. (Reprint) São Paulo: Humanistas / FFLCH / USP _____, Neology and technologists. In: ISQUERDO, A. N.; ALVES I. M. (Org.). The sciences of lexicon: lexicology, lexicography and terminology. 2. ed. Campo Grande, MS: Ed. UFMS: São Paulo: Humanistas, 2001. p. 25-31
- BARROS, L. A. Basic Terminology course. São Paulo: USP publisher, 2004 - (academic; 54).
- BERGAMIN FILHO, Armando et al. (1995). Phytopathology Manual principles and concepts. 2 v. 3rd ed. São Paulo: Agronomia Ceres
- BEVILACQUA, C. R and FINATTO, M. J. B. (2006). Lexicography and terminology: some fundamental counterpoints. In: Alfa, São Paulo. 50 (2): p. 43-54.
- BIDERMAN, M.T.C. (1981). The mental structure of the lexicon. In: Philology and linguistics studies. São Paulo: T. A. Queiroz EDUSP. 1981, p. 131-145.
- _____, The Lexicographic definition. In: Terminology. Federal University of Rio Grande do Sul, Institute of Letters. Notebooks of I. L. n. 10, Termisul. 1993.
- DUBOIS, J. et al. (2006). Linguistics dictionary. Trad. Izidoro Blikstein - 10th reprint from the 1st ed. 1978. São Paulo: Cultrix, 2006.
- BRAZILIAN AGRICULTURAL RESEARCH COMPANY (EMBRAPA). (2019). VII National Strawberry Symposium. Available at: <www.embrapa.gov.br/simpósio> Accessed on: 11 nov. 2019.
- FERREIRA, Aurélio Buarque de Holanda. (1999). Novo Aurélio 21st century: the dictionary of the Portuguese language. 3.ed. Rio de Janeiro: Nova Fronteira,
- GALLI, F et al. (1980). Phytopathology Manual diseases of cultivated plants. 2nd v. São Paulo: Agronômica Ceres
- HOUAISS, A; VILLAR, M. S. (2001). Electronic Dictionary of the Portuguese Language. Version 1.0. Rio de Janeiro: Objetiva
- KIMATI, H et al. (2005). Phytopathology Manual diseases of cultivated plants. 2nd v. 4th ed. São Paulo: Agronômica Ceres
- KRIEGER, M. da G. et al. (2006). Glossary of environmental management. São Paulo: Disal,
- KRIEGER, M, da, G .; FINATTO, M. J. B. (2004). Introduction to terminology: theory and practice. São Paulo: Contexto
- ORCHARD. Coletânea Sítio & Cia Especial. 2. ed. São Paulo: Casa Dois, 2008.
- Secretariat of the Ministry of Agrarian Development (2019). Available at: <www.mda.gov.br>. Accessed on: 10 dez. 2019.