

Terminologization And Determinologization In Selection and Seed Production Terminology: A Multilingual Analysis (German, English, Russian, Uzbek)

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Abstract: This study investigates the processes of terminologization and determinologization in the field of selection and seed production terminology through a multilingual analysis of German, English, Russian, and Uzbek. The research is based on an author-developed multilingual glossary corpus, which serves as the primary empirical source for identifying semantic transformations between general-language lexical units and specialized terminological meanings.

The study aims to examine how lexical units shift between general and specialized domains and to identify the underlying cognitive, functional, and structural mechanisms of this interaction. The methodological framework combines corpus-based analysis, semantic and comparative approaches, and a cognitive-functional perspective, enabling a systematic investigation of cross-linguistic patterns.

The findings demonstrate that terminologization is primarily realized through semantic narrowing, conceptual specification, and system integration, whereby general-language words acquire precise and domain-specific meanings. In contrast, determinologization operates through semantic expansion, metaphorization, and functional recontextualization, allowing specialized terms to enter general language and develop broader, often figurative meanings. The analysis confirms that these processes are systematic, cognitively motivated, and closely linked to discourse variation.

The cross-linguistic comparison reveals that, despite typological differences between analytic (English), compounding (German), inflectional (Russian), and agglutinative (Uzbek) language systems, the underlying semantic mechanisms are largely universal. However, their formal realization and productivity vary across languages due to structural, sociolinguistic, and contact-related factors. In particular, English shows a high degree of lexical flexibility, while German and Russian maintain relatively stable terminological structures, and Uzbek reflects an intermediate model influenced by both internal development and borrowing.

The study also highlights the functional implications of these processes for terminology standardization, multilingual lexicography, and translation. It argues for a dynamic and context-sensitive approach to terminology management, where variation is systematically described rather than eliminated.

The scientific novelty of the research lies in the first comprehensive analysis of terminologization and determinologization in agricultural terminology based on a multilingual glossary corpus. The results contribute to terminology theory, cognitive linguistics, and agricultural linguistics, and provide practical insights for glossary design, knowledge representation, and multilingual communication.

Keywords: Terminology, terminologization, determinologization, agricultural terminology, multilingual analysis, semantic change.

Introduction: In contemporary terminology studies, the boundary between specialized vocabulary and general language has become increasingly fluid, particularly in rapidly evolving scientific domains. Traditional terminology theory, which was based on the principle of one concept – one term, tended to treat terminological units as stable, context-independent entities. However, modern approaches have demonstrated that terminological systems are dynamic and closely interconnected with general language, allowing lexical units to shift between specialized and non-specialized usage depending on communicative needs and discourse conditions (Cabr , 1999; Temmerman, 2000; L’Homme, 2020; Khamidov, Mirmukhsin, 2021). This dynamic interaction is conceptualized through the processes of terminologization and determinologization. Terminologization refers to the transformation of a general-language lexical unit into a specialized term through semantic narrowing, conceptual specification, and domain restriction. Conversely, determinologization denotes the process by which a specialized term enters general language, often undergoing semantic expansion, metaphorization, and functional recontextualization (Faber, 2012; Temmerman & Van Campenhoudt, 2014). These processes reflect the adaptive nature of language and its ability to reorganize knowledge across different communicative domains.

In agricultural discourse, and particularly in the field of selection and seed production, such processes are especially prominent. The domain integrates biological, genetic, technological, and practical knowledge systems, which leads to intensive lexical exchange between specialized terminology and general vocabulary. As a result, many terms originate from common lexical units (e.g., line, material, culture) and acquire specialized meanings, while others, such as hybrid, selection, or elite, expand beyond their terminological boundaries and become part of everyday language. This bidirectional movement creates a complex system of semantic shifts that directly affects terminological precision, translation accuracy, and knowledge representation.

Recent international research emphasizes that insufficient control over these processes may lead to conceptual ambiguity, inconsistency in multilingual

communication, and difficulties in lexicographic description (ISO, 2009; Wright, 2022). At the same time, studies in corpus-based terminology and multilingual lexicography demonstrate that the systematic analysis of such shifts can significantly improve terminology standardization and glossary design (Bowker & Pearson, 2002; Kerremans et al., 2004).

Russian terminology research has also contributed substantially to the study of the interaction between specialized and general vocabulary, particularly in the context of scientific language development and lexical systematization (Superanskaya, 2003; Reformatsky, 2004). In Uzbek linguistics, issues related to terminological development, lexical adaptation, and the formation of specialized vocabularies have been addressed in works focusing on the evolution of scientific terminology and language modernization processes (Madvaliyev, 2010; Rahmatullayev, 2011). These studies highlight the importance of national linguistic frameworks in shaping and interpreting terminological systems.

Despite these advances, the processes of terminologization and determinologization in selection and seed production terminology have not yet been systematically investigated from a multilingual perspective. In particular, there is a lack of research based on an integrated corpus that simultaneously covers German, English, Russian, and Uzbek terminological systems. This gap is especially significant given the growing importance of agricultural knowledge exchange, international cooperation, and multilingual documentation in the field.

The relevance of the present study lies in addressing this gap through the analysis of an author-developed multilingual glossary corpus, which provides a unique empirical basis for tracing the interaction between general vocabulary and specialized terminology. The object of the study is the dynamic layer of selection and seed production terminology, while the subject is the semantic, functional, and structural mechanisms underlying terminologization and determinologization processes.

The aim of the study is to identify and classify the main patterns of lexical transformation between general language and specialized terminology in a multilingual

context. To achieve this aim, the following objectives are set:

- to examine the theoretical foundations of terminologization and determinologization;
- to analyze the processes of semantic specialization and generalization in agricultural terminology;
- to identify cross-linguistic similarities and differences in lexical transformation;
- to evaluate the implications of these processes for terminology standardization and multilingual lexicography.

The scientific novelty of the research lies in the fact that terminologization and determinologization processes in selection and seed production terminology are analyzed for the first time on the basis of a multilingual glossary corpus, with special emphasis on cross-linguistic comparison and functional interpretation.

In modern terminology studies, the interaction between specialized vocabulary and general language is understood as a dynamic and bidirectional process. Classical terminology theory tended to treat terms as stable, context-independent units with fixed meanings. However, contemporary approaches emphasize that terminological systems are embedded in broader lexical structures and are subject to semantic, functional, and pragmatic shifts depending on discourse conditions (Cabr , 1999; Temmerman, 2000; L'Homme, 2020). Within this framework, the processes of terminologization and determinologization have become central to understanding the evolution of specialized vocabulary.

Terminologization is generally defined as the process by which a lexical unit from general language acquires a specialized meaning and becomes part of a terminological system. This transformation is typically accompanied by semantic narrowing, conceptual specification, and increased contextual restriction. According to cognitive and communicative approaches, terminologization is not merely a lexical shift but a process of concept formation, in which a word becomes associated with a structured body of domain-specific knowledge (Faber, 2012; L'Homme, 2020). For example, general-language words such as *line*, *material*, or *culture* develop highly specialized meanings in agricultural and biological contexts, where they function as precise scientific designations.

Conversely, determinologization refers to the process by which a specialized term enters general language and undergoes semantic expansion, metaphorization, or functional reinterpretation. In this process, the strict conceptual boundaries of a term are often relaxed, allowing it to be used in broader communicative contexts. As noted in sociocognitive terminology, determinologization reflects the interaction between expert knowledge and everyday language, facilitating the dissemination of scientific concepts beyond specialized discourse (Temmerman, 2000; Temmerman & Van Campenhoudt, 2014). For instance, terms such as *hybrid*, *selection*, or *elite*, originally belonging to scientific domains, are now widely used in general language with extended or metaphorical meanings.

From a structural perspective, both processes are closely related to semantic change mechanisms, including specialization, generalization, metaphorization, and metonymy. These mechanisms have been widely discussed in both international and Russian linguistic traditions. Russian terminology research, in particular, has emphasized the role of semantic derivation and functional differentiation in the development of scientific vocabulary (Superanskaya, 2003; Reformatsky, 2004). These studies highlight that the boundary between term and non-term is not fixed but context-dependent and historically conditioned.

In Uzbek linguistics, similar issues have been explored in the context of language modernization, lexical enrichment, and the development of scientific terminology. Researchers have noted that many Uzbek terms emerge through the adaptation of common lexical units, which undergo semantic specialization within specific domains (Madvaliyev, 2010; Rahmatullayev, 2011). At the same time, the influence of international terminology, particularly through Russian and English, contributes to the emergence of parallel forms and accelerates both terminologization and determinologization processes.

From a functional perspective, terminologization and determinologization are closely linked to communicative needs and discourse variation. The Communicative Theory of Terminology argues that the use of terms depends on factors such as user expertise, communicative purpose, and textual genre (Cabr , 2000).

1999). In this sense, the same lexical unit may function as a strict scientific term in one context and as a general-language word in another. This duality is particularly evident in multilingual environments, where translation and cross-linguistic interaction further complicate the status of lexical units.

Another important aspect is the role of terminological standardization. While variation is a natural feature of language, excessive or uncontrolled variation may lead to ambiguity, inconsistency, and difficulties in knowledge transfer. International standards emphasize the need to regulate terminological systems by identifying preferred terms and controlling variant forms (ISO, 2009; Wright, 2022). In this context, understanding the processes of terminologization and determinologization is essential for developing effective strategies for terminology management and lexicographic description.

Thus, the theoretical framework of the present study is based on the assumption that the boundary between general language and specialized terminology is dynamic, context-dependent, and cognitively motivated. Terminologization and determinologization are not isolated phenomena but interconnected processes that reflect the continuous interaction between language, knowledge, and communication. This perspective provides a solid foundation for the empirical analysis of multilingual agricultural terminology presented in the following sections.

The present study adopts a corpus-based, comparative, and cognitive-functional approach to the analysis of terminologization and determinologization processes in selection and seed production terminology across German, English, Russian, and Uzbek.

The research is based on a multilingual terminological analysis, combining qualitative and comparative methods. The study focuses on identifying patterns of semantic transformation between general-language lexical units and specialized terminological meanings.

The methodological framework integrates:

- terminological analysis (to identify term status and domain specificity),
- semantic analysis (to trace meaning specialization and generalization),
- comparative analysis (to examine cross-linguistic

correspondences),

- cognitive-functional approach (to interpret conceptual and discourse-related shifts).

Such a multi-layered approach is consistent with contemporary terminology research, which emphasizes the importance of combining corpus evidence with conceptual and functional analysis (Cabr , 1999; L'Homme, 2020; Faber, 2012).

The empirical basis of the study is an author-developed multilingual glossary corpus, specifically compiled for the analysis of agricultural terminology in the domain of selection and seed production.

The corpus includes:

- terminological units in German, English, Russian, and Uzbek,
- lexical items representing both specialized terms and general-language words,
- synonymic pairs, doublets, and variants,
- translation equivalents across the four languages.

The glossary comprises several hundred terminological entries, each of which is structured according to:

- concept definition,
- language-specific equivalents,
- semantic scope,
- usage context (where applicable).

This structured corpus allows for the systematic identification of terminologization and determinologization patterns, as well as cross-linguistic comparison of lexical behavior.

The use of a glossary-based corpus is widely recognized as an effective method in terminology research, particularly for multilingual analysis and lexicographic applications (Bowker & Pearson, 2002; Kerremans et al., 2004).

The selection of lexical units for analysis is based on the following criteria:

1. Domain relevance – the unit must belong to the field of selection and seed production;
2. Dual status – the unit must demonstrate potential or actual use both as a general-language word and as a specialized term;
3. Cross-linguistic presence – the unit must have equivalents in at least two of the analyzed languages;

4. Semantic variability – the unit must exhibit signs of semantic narrowing, expansion, or functional shift.

These criteria ensure that the analysis focuses on dynamic lexical units, which are most relevant for studying the interaction between general and specialized language.

The analysis is carried out in several stages:

Stage 1: Identification of candidate units

Lexical items with potential dual status (general vs terminological) are extracted from the multilingual glossary.

Stage 2: Semantic classification

Each unit is analyzed in terms of:

- semantic narrowing (terminologization),
- semantic expansion (determinologization),
- metaphorization or functional shift.

Stage 3: Cross-linguistic comparison

The behavior of each unit is compared across German, English, Russian, and Uzbek to identify:

- similarities in semantic transformation,
- differences in lexical adaptation,
- language-specific tendencies.

Stage 4: Functional interpretation

The identified patterns are interpreted in relation to:

- discourse context (scientific vs general),
- user group (experts vs non-experts),
- communicative purpose.

This procedure allows for a comprehensive understanding of how lexical units move between general language and specialized terminology.

The reliability of the study is ensured by:

- the use of a systematically structured multilingual glossary,
- the application of consistent selection and classification criteria,
- the integration of theoretical and empirical analysis.

However, certain limitations should be noted. The analysis is restricted to a specific domain (selection and seed production), and the corpus is based on a curated glossary rather than large-scale textual data. Nevertheless, this limitation is compensated by the

high level of conceptual precision and terminological control provided by the glossary-based approach.

The analysis of the multilingual glossary corpus demonstrates that terminologization is one of the most productive mechanisms in the formation of agricultural terminology. In the field of selection and seed production, a significant number of terms originate from general-language lexical units that undergo semantic specialization and become part of a structured system of scientific knowledge.

From a cognitive and functional perspective, terminologization involves the transformation of a general lexical item into a conceptually restricted and domain-specific unit, characterized by increased semantic precision and reduced contextual variability (Faber, 2012; L'Homme, 2020). This process is particularly evident in multilingual environments, where the same lexical base is adapted across languages with varying degrees of specialization.

One of the primary mechanisms of terminologization is semantic narrowing, whereby a general-language word acquires a more specific and restricted meaning within a scientific domain.

For example:

- line → a genetically defined breeding unit
- Linie → genetische Zuchtlinie
- линия → селекционная линия
- liniya → seleksiya liniyasi

In general language, the word line denotes a broad range of meanings (e.g., a geometric line, a sequence, or a connection). However, in agricultural terminology, it becomes a highly specialized concept referring to a genetically stable population used in breeding programs.

Similarly:

- material → seed material
- Material → Saatgutmaterial
- материал → семенной материал
- material → urug' materiali

Here, the general notion of “material” is narrowed to a specific category within seed production, referring to biologically and technologically defined input resources.

These examples confirm that terminologization is closely linked to conceptual restriction and domain-specific interpretation, where meaning is defined by its position within a specialized knowledge system (Cabr , 1999).

Another important aspect of terminologization is conceptual specification, whereby a lexical unit becomes integrated into a broader terminological system and acquires precise relations with other concepts.

For instance:

- culture → plant culture (in vitro culture)
- Kultur → Pflanzenkultur
- култура → культура растений
- madaniyat / kultura → o'simlik madaniyati

While culture in general language may refer to social or intellectual phenomena, in agricultural and biological contexts it denotes a controlled process of plant cultivation, often in laboratory conditions.

This shift illustrates that terminologization involves not only semantic narrowing but also systemic embedding, where the term becomes part of a network of related concepts (e.g., growth, propagation, regeneration).

Such processes are consistent with cognitive approaches to terminology, which view terms as elements of structured conceptual systems rather than isolated lexical units (Faber & L'Homme, 2022).

In many cases, terminologization occurs through structural expansion, particularly via compounding and multi-word formation.

Examples include:

- seed → hybrid seed, certified seed, foundation seed
- Saatgut → Hybridsaatgut, zertifiziertes Saatgut
- семена → гибридные семена, сертифицированные семена
- urug' → gibrid urug', sertifikatlangan urug'

Here, the base word (seed) retains its general meaning but becomes part of a more complex terminological structure, where additional components specify its type, function, or status.

This process reflects the tendency of specialized language to achieve precision through combinatory expansion, allowing a limited set of lexical bases to

generate a wide range of domain-specific terms (Sager, 1990; Bowker & Pearson, 2002).

The comparative analysis reveals both universal and language-specific features of terminologization across German, English, Russian, and Uzbek.

- In English, terminologization often relies on analytic structures and multi-word expressions (seed material, breeding line).
- In German, it is frequently realized through compounding (Saatgutmaterial, Zuchtlinie).
- In Russian, derivational morphology and adjective-noun structures are common (семенной материал, селекционная линия).
- In Uzbek, agglutinative mechanisms and syntactic combinations play a key role (urug' materiali, seleksiya liniyasi).

Despite these structural differences, all languages demonstrate similar semantic mechanisms of specialization, confirming the presence of universal patterns in terminologization.

At the same time, the degree of specialization and lexical fixation may vary across languages, depending on factors such as scientific tradition, language policy, and the influence of international terminology.

The findings indicate that terminologization plays a crucial role in structuring and transmitting scientific knowledge. By transforming general-language words into precise terms, the process enables the creation of coherent terminological systems that support communication among experts.

At the same time, terminologization facilitates the integration of new concepts into existing lexical systems, allowing languages to adapt to scientific and technological developments.

From a communicative perspective, terminologized units serve as efficient tools of knowledge compression, where complex concepts are encoded in concise lexical forms (Temmerman, 2000; L'Homme, 2020).

The analysis of the multilingual glossary corpus confirms that terminologization in selection and seed production terminology is:

- systematic rather than random,
- based on semantic narrowing and conceptual

specification,

- supported by structural expansion and lexical combination,
- characterized by both universal and language-specific features.

These findings provide a solid empirical foundation for the subsequent analysis of determinologization processes, which represent the reverse direction of lexical transformation.

While terminologization reflects the specialization of general-language vocabulary, the reverse process - determinologization - demonstrates how specialized terms extend beyond their original domain and become part of general language. The analysis of the multilingual glossary corpus shows that determinologization is a systematic and cognitively motivated process, rather than a случайный semantic shift, and plays a significant role in the dissemination of scientific knowledge across discourse types.

From a theoretical perspective, determinologization involves semantic expansion, metaphorical transfer, and functional recontextualization, whereby a term loses part of its strict conceptual boundaries and acquires broader, often evaluative or figurative meanings (Temmerman, 2000; Faber, 2012). This process is particularly active in domains such as selection and seed production, where key scientific concepts easily enter public, educational, and media discourse.

One of the primary mechanisms of determinologization is semantic expansion, in which a term broadens its meaning and becomes applicable in non-specialized contexts.

For example:

- hybrid
- Hybrid
- гибрид
- gibrid

Originally, this term denotes the result of controlled crossing in genetics and plant breeding. However, in general language it is widely used to describe any combination of different elements, including technology (hybrid cars), culture, or even abstract concepts.

Similarly:

- selection
- Selektion
- селекция
- seleksiya

In specialized discourse, selection refers to a scientifically controlled breeding process. In general usage, however, it often denotes choice, preference, or assortment, losing its strict biological meaning.

These examples illustrate that determinologization leads to conceptual generalization, where a term becomes accessible to a broader audience but simultaneously less precise (L'Homme, 2020).

Another key mechanism is metaphorization, whereby terminological units acquire figurative or evaluative meanings in general discourse.

Examples include:

- elite
- Elite
- элита
- elita

In selection terminology, elite refers to high-quality, genetically superior seed material. In general language, however, it denotes social or intellectual superiority, often carrying evaluative or ideological connotations.

Another example:

- line
- Linie
- линия
- liniya

While in specialized terminology it refers to a genetically stable breeding unit, in general language it is used metaphorically to denote developmental direction, hierarchy, or continuity (e.g., political line, family line).

Metaphorization thus plays a crucial role in transferring scientific concepts into everyday cognition, enabling non-experts to understand complex phenomena through familiar conceptual frameworks (Temmerman, 2000; Temmerman & Van Campenhoudt, 2014).

Determinologization is also driven by functional recontextualization, where terms shift between

different discourse environments.

In the analyzed corpus, the following patterns can be observed:

- scientific discourse → precise, strictly defined usage
- educational discourse → simplified, explanatory usage
- media discourse → metaphorical and generalized usage
- everyday communication → highly flexible and context-dependent usage

For instance, the term hybrid in scientific articles retains its exact genetic meaning, while in media texts it may refer to mixed systems or innovations, and in everyday language it may simply denote “a combination of different things.”

This demonstrates that the degree of determinologization depends on communicative context and audience, which aligns with the communicative theory of terminology (Cabr , 1999).

The comparative analysis across German, English, Russian, and Uzbek reveals both shared and language-specific tendencies:

- In English, determinologization is particularly productive due to its role as a global lingua franca and source of international terminology.
- In German and Russian, terminological meanings tend to remain more stable in scientific contexts, but metaphorical extensions are активно used in public discourse.
- In Uzbek, determinologization often occurs through borrowing and semantic adaptation, where international terms acquire broader meanings in everyday usage.

Despite these differences, all four languages demonstrate a common tendency toward semantic flexibility and functional expansion of terminological units.

The findings indicate that determinologization has both positive and negative effects:

Positive:

- facilitates knowledge dissemination
- bridges the gap between experts and non-experts
- enriches general vocabulary

Negative:

- reduces terminological precision
- creates ambiguity in translation
- complicates standardization and lexicography

Therefore, modern terminology management should not aim to eliminate determinologization but rather to monitor and regulate its impact, particularly in multilingual contexts (ISO, 2009; Wright, 2022).

The analysis shows that determinologization in selection and seed production terminology is:

- a systematic and context-driven process,
- based on semantic expansion and metaphorization,
- closely linked to discourse variation,
- influenced by cross-linguistic and sociocultural factors.

Together with terminologization, it forms a dynamic continuum, reflecting the constant interaction between specialized knowledge and general language.

The comparative analysis of terminologization and determinologization processes across German, English, Russian, and Uzbek reveals both universal cognitive mechanisms and language-specific structural patterns. The multilingual glossary corpus provides empirical evidence that, despite typological differences, all four languages demonstrate similar tendencies in the interaction between general vocabulary and specialized terminology. At the same time, the degree, form, and productivity of these processes vary depending on linguistic structure, scientific tradition, and sociolinguistic context.

Across all four languages, terminologization is primarily driven by:

- semantic narrowing,
- conceptual specification,
- system integration,

while determinologization is characterized by:

- semantic expansion,
- metaphorization,
- functional recontextualization.

For example, the term hybrid / Hybrid / гибри  / gibrid demonstrates a consistent pattern:

- in specialized discourse → genetically defined product

of crossing

in general language → any combination or mixture

Similarly, line / Linie / линия / liniya shows:

- terminological usage → breeding unit
- general usage → abstract structure or direction

These patterns confirm that semantic transformation mechanisms are largely universal, reflecting shared cognitive strategies in conceptualizing scientific knowledge (Faber, 2012; L'Homme, 2020).

Despite these universal tendencies, the linguistic realization of terminologization differs significantly across languages.

English (analytic system)

- relies on multi-word expressions and syntactic combinations
- examples: seed material, breeding line, plant culture
- high flexibility and productivity

German (compounding system)

- characterized by lexical compounding
- examples: Saatgutmaterial, Zuchtlinie, Pflanzenkultur
- high degree of lexical condensation and precision

Russian (inflectional system)

- uses derivational morphology and adjective-noun structures
- examples: семенной материал, селекционная линия
- strong grammatical marking of relations

Uzbek (agglutinative system)

- relies on syntactic combinations and affixation
- examples: urug' materiali, seleksiya liniyasi
- transparent structure but often dependent on borrowing

These differences show that while the conceptual basis of terminologization is shared, its formal realization is typologically conditioned (Khamidov Mirmukhsin, 2026).

The processes of determinologization also display both shared and divergent tendencies.

- In English, determinologization is highly productive due to the language's role as a global scientific medium. Terms quickly enter general discourse and acquire

metaphorical meanings.

- In German, determinologization is present but often remains closer to the original scientific meaning, especially in formal contexts.

- In Russian, the influence of academic tradition contributes to relatively stable terminological usage, although metaphorization is common in media discourse.

- In Uzbek, determinologization is strongly influenced by language contact, particularly through Russian and English, resulting in hybrid usage patterns and semantic adaptation.

For instance, the term elite / Elite / элита / elita shows:

- in terminology → high-quality seed category
- in general language → socially privileged group

However, the degree of semantic shift and frequency of usage vary across languages (Khamidov, Mirmukhsin & Khamidova, Tilovatkxon, 2011).

A key factor influencing both terminologization and determinologization is language contact, especially the dominant role of English as a global source of scientific terminology.

- Many terms enter Russian and Uzbek through borrowing or calquing
- German often combines native compounding with international elements
- Uzbek shows parallel usage of native and borrowed forms

Examples:

- hybrid → гибрид → gibridd
- selection → селекция → seleksiya

This process leads to the emergence of hybrid terminological systems, where international and local elements coexist.

Such findings are consistent with modern terminology research, which highlights the importance of multilingual interaction in shaping terminological systems (Cabr , 1999; Temmerman, 2000).

The comparative analysis shows that the balance between terminologization and determinologization affects:

- terminological precision
- translation equivalence

- lexicographic representation
- knowledge transfer efficiency

Languages with high determinologization (e.g., English) tend to have greater communicative flexibility but lower precision, whereas languages with stronger terminological stability (e.g., German, Russian) maintain higher conceptual clarity.

Uzbek occupies an intermediate position, where both tendencies interact under the influence of multilingual communication.

The overall analysis demonstrates that:

- terminologization and determinologization are universal but variably realized processes,
- linguistic structure (analytic, synthetic, agglutinative) influences formal expression,
- language contact plays a crucial role in terminological development,
- multilingual comparison reveals hidden asymmetries in conceptual representation.

These findings confirm that the study of agricultural terminology requires not only domain-specific knowledge but also a multilingual and typological perspective, which allows for a deeper understanding of how scientific concepts are constructed and communicated across languages.

The analysis of terminologization and determinologization processes in selection and seed production terminology reveals that these phenomena are not merely lexical transformations, but reflect deeper cognitive and functional mechanisms underlying knowledge representation and communication. The interaction between general language and specialized terminology demonstrates how linguistic units evolve in response to conceptual structuring, discourse needs, and communicative efficiency.

From a cognitive perspective, terminologization involves the transformation of a general lexical unit into a specialized conceptual entity, embedded within a structured knowledge system. This process can be interpreted as a form of conceptual restructuring, where the meaning of a word becomes more precise, constrained, and systematically related to other domain-specific concepts (Faber, 2012; L'Homme, 2020).

For instance, the term *line* evolves from a broad, abstract notion into a clearly defined concept within plant breeding, associated with genetic stability, selection cycles, and reproduction strategies. Similarly, culture undergoes a shift from a general socio-cultural concept to a technical term referring to controlled biological processes.

In contrast, determinologization reflects the reverse process, where a specialized concept is reintegrated into general cognition, often through simplification and abstraction. In this case, complex scientific meanings are reduced to more accessible conceptual schemas, allowing non-experts to interpret and use the term in broader contexts.

The findings confirm that both terminologization and determinologization are closely linked to frame-based cognition, where the meaning of a term depends on the conceptual structure (frame) it activates.

- In specialized discourse, a term activates a technical frame with precise parameters and relations.
- In general discourse, the same term may activate a broader or metaphorical frame, emphasizing only certain aspects of the concept.

For example, the term *hybrid* in scientific contexts activates a frame related to genetic crossing, heterosis, and breeding methodology. In general language, however, it activates a simplified frame of “mixture” or “combination,” omitting its technical details.

This demonstrates that terminological meaning is not fixed, but dynamically constructed through interaction between language, cognition, and context (Temmerman, 2000; Faber & L'Homme, 2022).

From a functional perspective, the movement of lexical units between general and specialized language reflects their adaptation to different communicative environments.

The analysis shows that:

- scientific discourse prioritizes precision, stability, and unambiguity;
- educational discourse balances precision with accessibility;
- media discourse favors simplification and metaphorical usage;
- everyday communication emphasizes flexibility and

interpretability.

As a result, the same lexical unit may perform different functions depending on the discourse type. Terminologization strengthens the role of a term as a carrier of specialized knowledge, while determinologization enhances its function as a tool of communication across knowledge domains.

This dual functionality confirms the principles of the Communicative Theory of Terminology, according to which terminological units are shaped by user needs and communicative contexts (Cabr , 1999).

Another important implication concerns the processes of knowledge compression and expansion.

- Terminologization leads to knowledge compression, where complex scientific information is condensed into precise and compact lexical units.

- Determinologization results in knowledge expansion, where specialized concepts are simplified and disseminated across broader audiences.

For example, the term elite seed encodes a highly specific set of criteria related to genetic purity, certification, and production standards. When the term elite enters general language, it expands to denote any form of superiority, losing its strict technical parameters.

This dynamic illustrates how language functions as a mediator between expert knowledge and general understanding, enabling both precision and accessibility.

In a multilingual context, the cognitive and functional effects of terminologization and determinologization become even more complex.

The analysis shows that:

- different languages may conceptualize the same phenomenon with varying degrees of specificity;
- translation may either preserve or distort conceptual structures;
- borrowed terms may carry both specialized and generalized meanings simultaneously.

For instance, international terms such as hybrid or selection may retain their scientific meaning in one language while being partially generalized in another. This creates potential challenges for cross-linguistic equivalence and knowledge transfer.

Thus, multilingual terminology requires careful consideration of conceptual alignment and semantic consistency (L'Homme, 2020; Temmerman & Van Campenhoudt, 2014).

The overall findings demonstrate that:

- terminologization and determinologization are cognitively grounded processes,
- they reflect conceptual restructuring and frame activation,
- they enable functional adaptation across discourse types,
- they facilitate both knowledge compression and dissemination,
- they play a crucial role in multilingual communication and knowledge transfer.

These insights confirm that the study of agricultural terminology should go beyond purely lexical analysis and incorporate cognitive and functional perspectives, which provide a deeper understanding of how scientific knowledge is constructed, transformed, and communicated.

The results of the present study have significant implications for terminology standardization, multilingual lexicography, and knowledge management in the field of agricultural sciences. The analysis of terminologization and determinologization processes demonstrates that the boundary between general language and specialized terminology is inherently dynamic, which necessitates more flexible and context-sensitive approaches to terminology regulation and description.

Traditional terminology standardization has been largely based on the principle of univocity, which promotes the use of a single term for each concept. However, the findings of this study show that both terminologization and determinologization inevitably generate variation, synonymy, and functional diversity (Khamidov Mirmukhsin, 2026)..

Therefore, modern terminology management should move from rigid standardization toward a graded and descriptive model, where:

- one term is identified as the preferred (dominant) form,
- alternative designations are classified as admitted

variants,

- usage contexts are clearly specified.

Such an approach aligns with international standards, which emphasize the need to balance precision with communicative functionality (ISO, 2009; Wright, 2022).

The study highlights that synonymy and variation are not merely problematic phenomena but also structurally and functionally motivated features of terminological systems. In multilingual environments, these phenomena become even more complex due to:

- cross-linguistic differences in conceptualization,
- translation-induced variation,
- interaction between international and national terminologies.

Therefore, terminology resources should systematically:

- identify synonymic clusters,
- distinguish between full and partial equivalents,
- indicate semantic and functional differences between variants.

This is particularly important in domains such as selection and seed production, where terminological precision directly affects scientific communication and practical implementation (Bowker & Pearson, 2002; Kerremans et al., 2004).

The findings of the study provide a methodological basis for improving multilingual glossary compilation, especially when dealing with dynamic terminological systems.

A modern glossary should include:

- clear concept definitions,
- cross-linguistic equivalents,
- indication of term status (preferred, variant, obsolete),
- notes on terminologization or determinologization,
- contextual usage examples where necessary.

The author-developed multilingual glossary used in this study already demonstrates the effectiveness of such an approach, as it allows for the identification of semantic shifts, synonymic relations, and functional differences across languages.

This confirms that glossary design should not be limited

to simple equivalence mapping but should reflect the conceptual and functional complexity of terminology (L'Homme, 2020).

The interaction between terminologization and determinologization creates significant challenges for translation and cross-linguistic equivalence.

The analysis shows that:

- a term in one language may be fully specialized, while its equivalent in another language may already be partially generalized;
- determinologized units may lead to semantic ambiguity in translation;
- direct equivalence is often replaced by partial or context-dependent equivalence.

Therefore, translators and terminologists must consider not only lexical correspondence but also:

- conceptual scope,
- degree of specialization,
- discourse context.

This approach is essential for ensuring accurate knowledge transfer in multilingual scientific communication.

Based on the findings, it is possible to propose a dynamic model of terminology management, which takes into account the continuous interaction between general language and specialized terminology.

Such a model should:

- recognize terminologization and determinologization as natural processes,
- incorporate variation as a functional feature rather than an error,
- support adaptive standardization strategies,
- integrate corpus-based and cognitive approaches.

This perspective reflects the current тенденции in terminology research, where emphasis is placed on flexibility, contextualization, and user-oriented description (Temmerman, 2000; Faber & L'Homme, 2022).

In the specific context of agricultural sciences, the study suggests that:

- terminological systems should be regularly updated to reflect ongoing semantic changes;

- multilingual glossaries should be developed to support international cooperation;
- educational materials should distinguish between specialized and generalized usage of terms;
- standardization efforts should consider both scientific precision and communicative accessibility.

These measures are essential for improving the quality of scientific discourse, translation practices, and knowledge dissemination in the field of selection and seed production.

CONCLUSION

The present study has demonstrated that the interaction between general language and specialized terminology in the field of selection and seed production is governed by the dynamic and interrelated processes of terminologization and determinologization. Based on the analysis of an author-developed multilingual glossary corpus covering German, English, Russian, and Uzbek, the research has shown that these processes are not случайный, but systematic, cognitively motivated, and functionally conditioned.

The findings confirm that terminologization primarily operates through semantic narrowing, conceptual specification, and system integration, allowing general-language lexical units to evolve into precise scientific terms. In contrast, determinologization is characterized by semantic expansion, metaphorization, and functional recontextualization, enabling specialized terms to enter broader communicative domains and become part of general language.

The comparative analysis has revealed that, despite typological differences between analytic, inflectional, and agglutinative languages, the underlying semantic mechanisms of lexical transformation are largely universal. At the same time, the formal realization and productivity of these processes vary across languages due to structural features, scientific traditions, and sociolinguistic factors. In particular, English demonstrates a high degree of lexical flexibility, while German and Russian maintain relatively stable terminological structures, and Uzbek reflects an intermediate model shaped by both internal development and external influence.

From a cognitive and functional perspective, the study

has shown that terminologization and determinologization contribute to conceptual restructuring, frame activation, and discourse adaptation, enabling language to mediate between expert knowledge and general understanding. These processes facilitate both knowledge compression and dissemination, highlighting their essential role in scientific communication.

The research also emphasizes that terminological systems should not be viewed as static and strictly regulated structures. Instead, they should be approached as dynamic, context-sensitive systems, where variation, synonymy, and semantic shifts are natural and functionally motivated phenomena. In this regard, the study proposes a more flexible approach to terminology standardization, based on the identification of preferred terms, controlled variation, and context-dependent usage.

The scientific novelty of the study lies in the fact that terminologization and determinologization processes in agricultural terminology have been analyzed for the first time on the basis of a multilingual glossary corpus, with special emphasis on cross-linguistic comparison and functional interpretation. The results contribute to the development of terminology theory, multilingual lexicography, and agricultural linguistics, and provide practical recommendations for glossary design, translation, and terminology management.

Future research may expand the scope of analysis by incorporating larger textual corpora, additional languages, and other domains of specialized knowledge. Such studies would further enhance our understanding of the dynamic interaction between language and knowledge in multilingual scientific communication.

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