

Agrotoxics and the Agribusiness Industry: Discourses for a toxic life. An analysis from a social determinants of health perspective

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Abstract *In Colombia, the agribusiness industry argues that pest control is essential to feed the world population, establishing a new model of production based on the intensive use of agrotoxics. However, the health impacts of these products are absent from the industry's discourses. This study used critical discourse analysis to analyze and characterize discourses of modes of production and work process that lead to exposure to agrotoxics and health impacts among families in rural areas of Usme and Sumapaz in Colombia. The following data collection techniques were used: participant observation, semi-structured interviews, and document analysis. The discourses show that interaction between structural forms that define the construction of reality transforms subjects. In the case of agribusiness and the use of agrotoxics, this interaction constitutes institutional symbolic violence. This discursive relationship imposes an everyday life that normalizes exposure to agrotoxics and transfers the responsibility for their health impacts to rural communities.*

Key words *Agrotoxics, Agribusiness, Social determination, Environmental health, Occupational health*

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Introduction

Agricultural production in Colombia is characterized by capital accumulation and dominated by transnational corporations that control practically the entire food chain^{1,2}, using mechanisms of domination and subordination to transform traditional peasant agriculture³. Apart from transforming the relationship between rural populations and nature⁴, the industrial model of farming seeks to standardize work processes by planting one type of crop, a single living form transforming energy into homogeneous food products⁵.

Monocultures cause ecological imbalance and facilitate the emergence of other species, which, in their search for food, limit capital accumulation⁶. This makes biodiversity a limiting factor for the dynamics of good agroeconomic practices. A negative blanket term has been created for this limiting factor, a biblical metaphor that alludes to the arrival of the “pest”^{6,7}. The agribusiness industry’s main objective is therefore to reduce production risks by waging war on these pests.

As part of this war, the industry uses “agrotoxics”, designed to kill all forms of life that destroy crops. As a result, today global pesticide consumption amounts to more than four million tons per year⁸. The argument that pest control is necessary to produce enough food for everyone is used to justify a model of production based on the intensive use of biocides, serving only the interests of agribusiness.

However, the health impacts of these products are absent from the industry’s discourse. These impacts are aggravated by low levels of social security coverage in rural areas, which is limited to a minority of rural workers in formal employment. This in turn limits access to occupational risk prevention services and leads to the underreporting of the health effects of exposure to these products.

This type of farming gives rise to a contradiction between production and health, with numerous epidemiological studies showing the effects of agrotoxics on the health of workers and their families, notably teratogenicity and negative child neurodevelopment outcomes⁹⁻¹².

However, approaches tend to reduce this issue to a biological phenomenon void of history and social context, ignoring the social factors that influence the use of agrotoxics by peasant farmers¹³⁻¹⁵. For this reason, this article suggests that the relations established by agribusiness define the economic, social, and cultural processes that determine the health of subjects and groups.

Empirically speaking, some of these processes are expressed in a specific system of ideas, senses, and meanings, an ideological formation that promotes and hypes up particular modes of farming, while at the same time establishing processes that harm human health through exposure to agrotoxics¹⁴. This formation materializes in discourses and is present in the social struggle for conservation or resistance to domination¹⁶.

In this way, relationships between structures and forms of life are established in communities around the world¹⁶⁻¹⁸. Hence, the construction of subjectivity and intersubjectivity manifests structuring dispositions, that is, dispositions that guide the practical choices that define rural life through schemes of perception adopted by communities throughout their lives¹⁸. This shift in perception of the rural world is shaped by discourses within settings of symbolic struggle against hegemony that legitimize industrial practices and deny the negative impacts of industrial agriculture¹⁸. These discourses are targeted at rural communities, who either accept it or reject it, depending on the perceptions of interlocutors, symbolic power, and their level of practical competence within rural modes of production^{19,20}.

In light of the above, this study sought to understand the use of the food production discourse and agrotoxics in Usme and Sumapaz in Colombia. To this end, we used critical discourse analysis (CDA), which allowed us to study the effect of meaning on the interlocutors and identify meanings assigned to agrotoxics¹⁶ in order to understand how discourses generate social power, which dominates and creates illness-generating processes¹⁹.

To this end, the discourses were grouped as follows using the three social determinant domains proposed by Breilh¹³: 1) discourses addressing the structural relations and processes of accumulation that define models of production that use agrotoxics (general domain); 2) discourses involving the organicity of accumulations that determine the work processes and practices involved in the use of agrotoxics (particular domain); and 3) discourses expressing mental representations of the health effects of agrotoxics, depicting the materialization of structures in bodies (singular domain). The aim of this article is therefore to analyze and characterize discourses of models of production and work processes that lead to exposure to agrotoxics and health impacts among families in rural areas of Usme and Sumapaz.

Method

This article presents the findings of the qualitative component of a study of social determinants of health among children in rural areas exposed to agrotoxics. The data were collected in Usme and Sumapaz in Bogotá, where one of the main economic activities is intensive potato and chick-pea farming characterized by heavy pesticide use²¹.

The data were collected using participant observation, semi-structured interviews, and document analysis. For participant observation, we visited 42 plantations, 30 using industrial methods and 12 that adopt agroecological practices. We also observed the potato growing cycle, from soil preparation to the sale of produce, taking notes on activities. Key activities during the purchase, use, and disposal of agrotoxics were filmed, resulting in a total of 720 hours of observation.

Seventeen semi-structured interviews were conducted with subjects who live in rural areas and rural workers. The inclusion criteria were participants who had been living and working in the region for at least one year. Chart 1 shows the interviewee codes and production model.

The number of interviews was determined using theoretical saturation, which is reached when additional data do not generate any new elements. To this end, the interviews were analyzed using a saturation matrix²².

The interviews were conducted using an interview guide to capture discourses on production models, work processes, and use of agrotoxics, and the relationship between these elements and the health-sickness process. The questions were open ended, with no influence on any specific alternatives suggested by the interviewer²³. The interviews were transcribed and for the purposes of discourse analysis, notes on the researcher's subjective impressions of the linguistic and extralinguistic elements of the interviewees' statements were also considered²⁴.

The document analysis consisted of eight institutional documents, three of which concerning local rural development and four addressing recommendations regarding the use of agrotoxics. Finally, we created a document consisting of three interviews with institutional actors about cases of pesticide poisoning in rural areas published on digital news platforms in 2019 (Chart 2).

To gain a deeper understanding of the meanings assigned by the subjects, a first reading of the corpus was performed to gain an insight into the

context of the discourses, the respondents, and their circumstances. The second reading focused on the fragments of text related to the theoretical categories, coding statements based on the association between textual elements and the theoretical constructs of the general, particular, and singular domains mentioned above. Links between textual units were highlighted to identify repetitive, associated, and contradictory elements, generating a semantic web of empirical material. Finally, we performed another reading to identify the relationship between the production of meanings, when a word, sentence, or gesture acquires symbolic representation. Following the assumptions of CDA, we studied the relationship between the construction of forms of language in the texts and their use in rural settings²⁵.

The textual units and semantic webs were classified empirically as ideological formations of the agribusiness industry. The ideological formations, which reproduce themselves and are embodied in the memory of the subjects, are classified in the texts as discourses (D) or practices (P), making the empirical material a presentation of the predicate, giving it historical significance: the acquisition of meaning and symbolism (symbolic power)¹⁹. To this end, we returned to the analysis and lexical codes, searching for commonly used words, euphemisms, and metaphors in the discourses and writings of the actors. These were identified and marked in the texts as ways of exercising power that seek to control or modulate what is said and not said about the reality of life and health in rural areas²⁴.

Finally, we grouped the textual elements related to the social determinants of health framework. Data analysis was performed using ATLAS.ti version 9.

Results and discussion

General domain: the potential and harmlessness of agrotoxics

The discourse of subjects from organizations that promote agribusiness, which are external to rural life, constructs a definition of rurality as *potential*, an element of development and economic success. They represent an urban, commercial bourgeoisie interested in accumulation through the trade and export of agricultural and food products.

It is worth mentioning that discourses of rurality in Colombia center around production,

Chart 1. Interviewee codes and production model.

Code	Sex	Predominant production model
P6	Female	Agroecology
P7	Male	Industrial
P8	Female	Agroecology
P9	Female	Agroecology (agronomist)
P10	Male	Industrial, transitioning to agroecology
P13	Male	Industrial
P14	Female	Agroecology
P15	Male	Industrial
P16	Male	Industrial
P20	Male	Industrial
P21	Male	Industrials (wholesaler)
P22	Male	Industrial
P23	Female	Agroecology
P24	Male	Industrial
P22	Male	Industrial
P23	Male	Industrial
P24	Male	Industrial

Source: Authors.

with the documents highlighting the potential of the rural population for exporting food. To this end, semantic construction is replete with nouns and adjectives typically used by the agribusiness sector, such as potential, development and success, almost always used to refer to the outside world and to export capacity.

Graph 1 shows that the most frequent lexical elements are the words *potential*, *millions*, *global* and *quality*.

The discourse of the agribusiness sector uses terms such as “leading driver” (*justification*), suggesting that the industry has a “*potential*” that needs to be developed, that is, that requires “investment”. Another keyword is “*player*”, a term commonly used in business management. A *player* is an “actor” who is in the game, not on the bench. A metaphor representing the market as a football stadium and agribusiness companies as key players.

The actor is the sector, which at the same time provides the illusion that small-scale farmers can take part in the game, be a player. All these syntactic elements are accompanied by the frequent use of complex technical terms and economic statistics to strengthen the “potential” discourse:

P1.2 (DI) Historically, the agribusiness sector has been one of the leading drivers of economic development in Colombia.

P1:5 (DI) [...] the agricultural sector, a major player in the Colombian economy.

P1:3 (DI) [...] with a view to turning them into global players.

P3:7 (DI) [...] develop a methodology that identifies and prioritizes existing agribusiness corporations and areas with new clusters that have agricultural potential [...].

Agribusiness uses its discourse to portray the sector as a subject of potential. In this case, the subject defines itself as having “potential” and the sector as a “player”, while the population vanishes, hidden below a blanket of discursive actions. This discourse belongs to social groups with commercial interests; in these texts it is possible to trace the construction of human action in rural areas seen as commodities, revealing the dehumanized and dehumanizing nature of the relationship between the market and rurality. As a result, the laws of capitalist production are normalized, and agribusiness reproduces itself economically. The structure of reification penetrates the human mind more and more intensely, to a point where the suffering caused by the industry, its interests, and needs are no longer seen²⁵.

The basis of success of agribusiness’ world of production is very unstable, not to mention the successive economic failures experienced by farmers. The “potential” discourse manipulates

Chart 2. Document codes and characterization.

Code	Type of document	Type of actor	Document name	Author
P1	Institutional document - DI Technical report	Agricultural development institute	The Colombian Agribusiness Sector	Proexport Colombia
P2	Round table talks minutes	Government organizations and FARC-EP	The Open Library of The Colombian Peace Process: Towards a New Colombian Countryside: Comprehensive Rural Reform	Office of the High Commissioner for Peace
P3	Institutional document - DI Technical report	Government organization	National Development Plan Reports 2018-2022	National Planning Department
P4	Institutional document - DI Rules and regulations	Government organizations	Decree 1843, 1991 on the use and management of agrotoxics	Ministry of Finance, Ministry of Agriculture, Ministry of Labor and Social Protection
P17	Institutional document - DI Brochure or technical guide	Organization that promotes agribusiness and use of agrotoxics	Pesticide packaging and return protocol	Clean Countryside Corporation
P18	Institutional document - DI Brochure or technical guide	Organization that promotes agribusiness and use of agrotoxics	Pesticide triple-rinsing technique	Clean Countryside Corporation
P19	Institutional document - DI Brochure or technical guide	Government organization	Good Agricultural Practices: A Guide for Agribusinesses	Colombian Agricultural Institute
P29	News about agrotoxics in the media between 2018 and 2019	Government organizations in the media	Why are accident rates high in the Colombian countryside? More than a million bees die from poisoning in Quindío Crop dusting plane flies close to small rural school: children poisoned Other school affected by dusting	Media

Source: Authors.

lived experience, matching what is said with an appropriate tone of promise. Rural workers should therefore work in continuous pursuit of potential under a model of production whose direct consequences include destruction of life:

P24:1 (man working in the agribusiness industry) Yes of course, no, no, no, it's that you get really screwed in the countryside, really screwed, it's obvious that prices are low in agriculture.

With the dissemination of this ideology in rural communities, workers are manipulated to

take on specific models of production, committed to the idea of potential and future growth and development, with the promise of a future of profit and accumulation²⁶.

The “potential” discourse adopted by the agribusiness industry therefore has a life-distorting effect, which is interpreted as intersubjective alienation of the subject-object relationship by the communicative rationality of the interests of others²⁵, disguising and perpetuating inequalities and poverty in rural areas.

In conclusion, the logic of communication seeks to impose models of production and work processes subsumed by agroexport interests, hiding the fact that the benefits of exporting agricultural products are centered around food trade and speculation. These discourses therefore distort the reality of marginality and poverty caused by this model.

The safety discourse

Linked to the “potential” discourse, we identified discourses about safe production and plant health, understood as the elimination of forms of life that interfere with capital accumulation, using different paraphrases and synonyms:

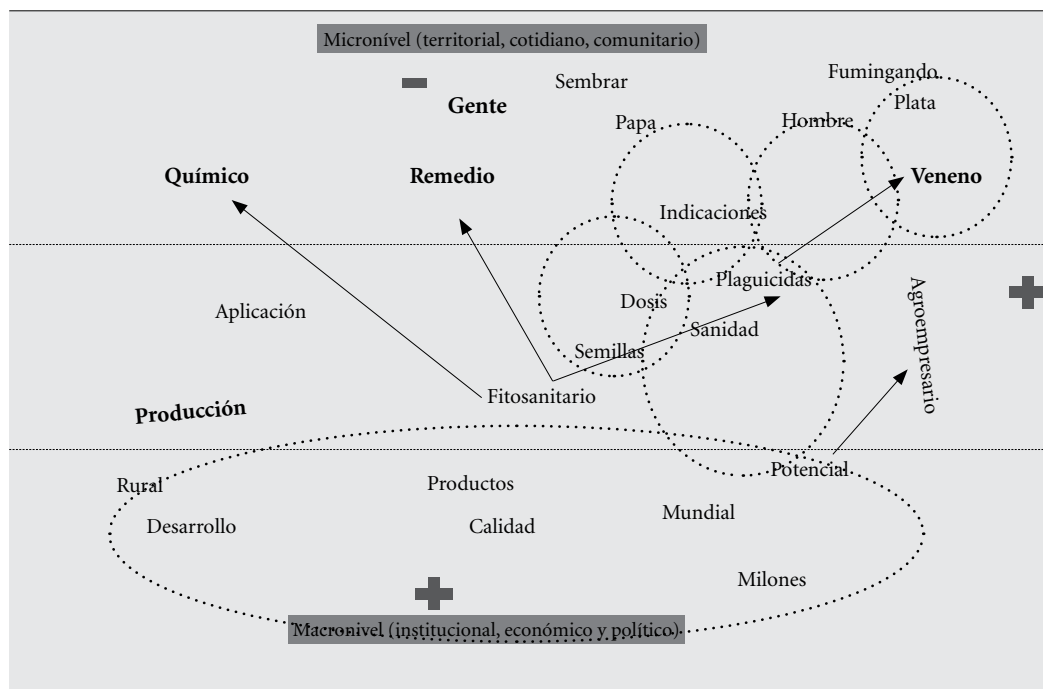
P3:2 (DI)[...] low productivity persists, the weakness of value chains and food safety and animal and plant health systems, which prevent [the industry from] harnessing both internal and external markets.

These discourses normalize the planting of monocultures, which cause intense ecological imbalance and lead to the emergence of “pests”, as reported in Latin America’s sugarcane plantations⁶. “Pests” certainly cause financial losses. Thence an industry emerges that produces

discourses offering technologies that maintain productivity, primarily agrottoxics that help crop development, and a new way of subsuming life in rural areas. Thus, the “potential” discourses, paraphrasing the safe-healthy-plant health rhetoric adopted by the institutions, are not read or scrutinized by rural communities, but rather conveyed using other much easier-to-understand messages.

During participant observation, we found that these discourses are conveyed by an organic intellectual from the agribusiness industry (an agrottoxics sale representative), an agronomist, or the owner of an agricultural and farm supplies store. The power of these actors resides in their cultural capital. They express themselves discursively using technical terms, always in direct contact with the community, pushing the economic-safe-plant health discourse¹⁸, transforming agricultural practices and giving advice on the use of agrottoxics for eliminating so-called pests:

P6:32 (woman working in agroecological farming) Just one shock and that’s it, you can continue selling or working; just one fumigation and hey presto; because he’s an agronomist too, because he’s an agronomist and grower, and he told me to apply it.



Graph 1. Lexical analysis of textual units in the documents and interviews.

Source: Authors.

Gramsci suggested that in rural settings this social group of organic intellectuals plays the role of intermediary between peasant farmers and the “general administration”; a group tasked with the technical organization of modes of production and work²⁷. These intellectuals are born on the terrain of an essential function in the world of the economic production of agribusiness, and at the same time a social class of intellectuals is created which give agribusiness homogeneity and an awareness and establish a process of formation of hegemony²⁸.

Lamosa²⁹ outlines how, making full use of creative capacity, the agribusiness “party” in Brazil has formed organic intellectuals responsible for disseminating the ideology of capital through public schools and the work of teachers. These intellectuals produce and disseminate the ideology of heads of companies and political parties who support agribusiness and the use of agrottoxics.

These discourses therefore determine the ideological enabling conditions for the reproduction of modes of production, while at the same time normalizing death and illness by fostering toxic lifestyles. In this regard, in a recent study investigating the relaxation of the rules and regulations governing pesticide use in Brazil, drawing on Foucault’s concept of biopower (2007) and the power to “make live” and “let die” and Mbembe’s (1997) writings on necropolitics, Gurgel *et al.*³⁰ explain how “policies of death” are engendered both by the state and by its absence. The authors show how the policy relaxing the rules governing the use of agrottoxics introduced by Jair Bolsonaro’s government was influenced by companies and constitutes a strategy to consolidate practices of biopower intended to satisfy the interests of financial capital, manipulating science and the law. According to the authors, the policy defines the lives of those who may be put at risk. Thus, poor working terms and conditions and vulnerability are conditions created by necropolitics to favor agrottoxics³⁰.

The particular domain: life centered around toxic work processes

Rural life, defined by institutional discourses, materializes in practices centered on work processes. Determined by modes of production, groups of workers and their families transform the nature of the territory, body, and subjectivity³¹. It can be observed that the relationship between work processes and agrottoxics is planned by external actors using task organization.

This is evident in the “*technical assistance*” provided by organic intellectuals, which is defined according to an institutional discursive framework and used by the pesticide industry to sell its products. In general, it can be said that there is an illusion of control over work, a core component of technical knowledge symbolized by agribusiness’ discursive formation, expressed as the elimination of pests, giving agrottoxics the capacity to materialize the desire for potential and safety.

During participant observation it became clear that the promotion of agribusiness is situated in a specific social space: agricultural and farm supplies stores. In general, these spaces are small, located in urban centers or peri-urban areas, and dominated by shelves full of agrottoxics and pharmaceutical industry advertising. Larger stores feature “technical assistance” provided by pharmaceutical companies and agronomists selling agrottoxics at the store entrance, where institutional discourses are reproduced using technical economic and chemical terms describing the products being sold.

The agronomists are predominantly men, whose body posture seeks to promote a form of symbolic domination. Technical language is mixed with rural jargon, powerful cars, and a stylish combination of urban clothing and work boots, imaginatively attempting to represent the ideal of agribusiness industry: the financially successful man.

The work of these men is not limited to agricultural and farm supplies stores. They often have to travel for work, especially to large farms, seeking to fertilize crops vulnerable to the threat of pests with the goodness of their knowledge.

In addition, seeds (many of which genetically modified), the main focus of their work, are bought in these stores, almost always as part of a technological package. Methods are defined by the store owner, consisting mainly of agrottoxics to eliminate other species that “threaten” rural areas and interfere in the accumulation of capital, becoming the ultimate solution to pests. Observed during participant observation, this process aims to subjugate agriculture and rural communities to the logic of accumulation and trade of toxic chemicals, leading to a contradiction whereby technical knowledge does not necessarily favor food production:

P6:26 (woman working in agroecological farming) Two or three chemicals are applied [...] the ones they use are chemicals, the same ones that the door-to-door salespersons sell [...] It didn't use to

happen in the region. Six or seven years ago salespersons from laboratories began to arrive and go from field to field delivering these products. They're agronomists, they go to the fields and plan for you so planting is on a certain date, and then they bring the disinfectants, fertilizers and everything, and tell you which days you have to fumigate.

Once transformed into the logic of others, the seeds are treated with preventive pesticide applications to "protect" them from insect and animal attacks, in addition to applications indicated for storage to avoid the proliferation of fungi and insects:

P28:142 (man working in the agribusiness industry): Yes, that is the good one, the poisoned seed.

Poisoned seeds need poisoned soil. After planting, soil "disinfection" methods are used, which translates into the application of insecticides and fungicides:

P22:21 (man working in the agribusiness industry) No, no, no, no, first you give broccoli a good poisoning, spraying as soon as the plant emerges, then another spray with poison. This one has already been sprayed three times, with this one four: one when it was planted, another when it got a bit bigger, another later, and this one now.

In the rural settings observed by this study, the structure of the concept of agrottoxics gives rise to polysemy, presenting a meaning with various other meanings, which are changed strategically according to the social space and situations of work practices and social reproduction, enabling the manipulation and domination of understanding and representation of meaning. That is, symbolic power is conferred to the use of agrottoxics, a power that has real effects.

The meaning of the institutions is conferred by decrees, guidelines, and recommendations regarding the use of agrottoxics and reproduced by agronomists. Agrottoxics are defined according to their technical characteristics (agents, substances or chemicals), featured in the glossary of terms. The documents emphasize their merely biocidal nature in work processes, because they prevent, destroy, combat, and control pests, listing their ideologically positive properties.

This positive notion is linked to effective actions that benefit food production and accumulation of capital. However, associated with this benefit, it is necessary to discursively construct a subject that is the target of these actions: the pest, insect, pathogen, the non-beneficial agent, the enemy to be destroyed:

P4:9 (ID) Any agent of a chemical, physical, or biological nature that in a mixture or combina-

tion is used for the prevention, combat, attraction, or control of insects, mites, pathogens, nematodes, weeds, rodents, or other organisms that are harmful to animals, plants, and derived products, health, or beneficial fauna.

The intention of this meaning is to communicate the need to increase productivity by eliminating non-beneficial species. The "agrottoxics" discourse, alluding to the biblical metaphor, where other living species are likely to destroy property, justifying their elimination.

Another metaphor used in agrobusiness discourses is that of the unhealthy crop, which needs a "remedy". The technical language of plant health has an incredible discursive capacity to reproduce itself in everyday rural life. The medical idea of healing is used, overlooking the idea of toxicity in work processes. The product is not toxic, but rather phytosanitary:

P25:23 (man working in the agribusiness industry): I don't know whether the chemists were inventing them based on diseases before, first we didn't have diseases, the diseases emerged, the remedies emerged.

These discourses therefore downplay the effects of agrottoxics on the health of humans and other species, which are disregarded in communications. In mental representations of health and the relationship between health and exposure to agrottoxics, the discourses manipulate the need to protect life, eliminating any consequences for workers and their families from social spaces. In this way, practices normalize the use of these methods in everyday life, for example fumigating in close proximity to children or actively involving pregnant women in preparation and fumigation:

P10:15 (man working in the agribusiness industry): Once, a man started fumigating next door to a school, and the teachers and children left the area and shut themselves in the classrooms.

As a discursive practice, communications eliminate the discussion about health impacts – including those involving vulnerable groups such as pregnant women and children – from social spaces. Manipulative discourses therefore legitimize the use of toxic chemicals in rural life.

In turn, peasant farmers in Usme and Sumapaz reproduce and transform these discourses. The presentification of practices has a simple meaning in communication. Technical terms disappear and the use of the word "pesticide" becomes very strange. However, associations with agrottoxics' biocidal actions stand out: "kill", "combat", "put an end to pests". Actions that have

one specific objective: the elimination of a particular type of pest (“moths”, “worms”, “flies”, “fungi”, among others):

P15:4 (man working in the agribusiness industry) ...kept fumigating as normal, and spraying practically everything with poison, on leaves, flies, worms, almost around the clock, poison, and I don't remember ever not using poison, not buying drugs and poisons.

One of the most frequently recognized lexical forms (Graph 1), the word “poison” does not appear in association with toxicity in humans. It is used discursively to emphatically emphasize the capacity of work processes to eliminate, put an end to the insect:

P22:3 (man working in the agribusiness industry) more than all the poison is used there. It's mixed, prepared in the can and sprayed, yes too high, yes sir. That's the function of the poison, because this is the poison I use here, this poison is strong, it's Fulminator [an insecticide].

The technical use of toxicity classification does not appear to be an element that influences health and safety work practices. Quite the contrary, it is used more as a symbol of efficiency, where highly-toxic re-label products are recognized as potent, efficient, and strong, while other colors (blue and green) are defined as “non-toxic” or fungicides:

P10:26 (man working in the agribusiness industry) And that worm is alive, that worm lives in the potato. Red-label remedies are used to kill that worm.

Finally, when agrotoxics cease to be a commercial product or part of the process of accumulation, their meaning changes; they become waste, a hazard, a risk:

P4:20: (ID) When applying agrotoxics in populated areas, to fish farms, bees, birds and other animals, and in water courses, springs, and special management areas for the protection of natural resources, the techniques used shall be accordance with the risks inherent in the respective activity.

This discourse implies that it is the farmers who are responsible for food safety. It constitutes a subtle way of transferring responsibilities, using expressions, the imperative mood conjugated in the first and third persons, and adjectives with the obligation of action, creating a framework of language use:

P19:(DI) As agribusinessmen, we are obliged to assure consumers that the fruit and vegetables we grow do not cause health problems. It is therefore our responsibility to produce safe fruit and vegetables.

The health and environmental impacts are transferred to the work practices involved in the use and final disposal of agrotoxics by peasant farmers, without taking into account the toxic nature of these products, generating manipulative discourse to transfer risks and putting the blame on certain groups. This discursive blanket is reproduced by some studies investigating health and safety at work, which define chemical risk as the failure to use personal protective equipment. However, this literature fails to recognize the processes of discursive dominance and strengthens an ideological formation that revictimizes peasant farmers^{32,33}.

The singular domain: the body and practices in toxic rurality

Finally, determined by structural and particular processes, the bodies of groups in the region mold and modify their psyche and biology over the course of their lifetimes. The agrotoxic-body interaction, defined as exposure, gives rise to pathophysiological processes involving toxicokinetic and toxicodynamic mechanisms within organisms, resulting in health-disease profiles associated with exposure and the particularities of rural groups at specific moment in time³⁴.

The first practice in which bodies come into direct contact with agrotoxics is preparation, where toxic products are mixed to produce the so-called pesticide “bombs” or “cocktails”, combinations of fungicides, insecticides, and/or foliar fertilizers prepared by one man: the most powerful, the one who has most experience, or the crop owner. The doses are usually defined by the farmer himself or technicians. In all the visits we made, the doses used were more than four times the recommended dose on the product label and leaflet, as if exceeding the dose was a demonstration of strength in a quest to reproduce recognition and achievement through the use of the product. Overdoses are not even associated with the possibility of greater exposure and toxicity and impacts on human health:

P10:03: (man working in the agribusiness industry) A rich man gets enthusiastic about mixing bombs in containers with agrotoxics. At the end of the day, this has no use at all for agriculture [...] these people get enthusiastic about mixing water with poison, washing; they say it washes the peas.

Environment, health, and safety practices in work processes embody the discursive formations domain within the general and particular domains, allowing the establishment of destruc-

tive processes. There are few ways of caring for the bodies of dominated workers, so environmental and work practice controls, such as the use of personal protective equipment, are practically non-existent:

P8:13 They died from the same thing that the fumigators died of; and they don't use face masks, it's like they inhaled it and died, of course they died, they were fumigating.

As mentioned above, institutional discourses seek to hold peasant farmers exclusively responsible for health and safety, marginalizing and antagonizing the practices they adopt. Indeed, the discourses of rural producers and peasant farmers seek to address this contradiction, placing the blame for health impacts on other people:

P10:30: (man working in the agribusiness industry) When we were sowing, there was a girl, I don't recall her last name, who drank the remedy [referring to the agrototoxic] and died, and a boy who was treated for [pesticide] poisoning.

It is worth noting that discourses in rural areas establish that the use of and exposure to agrottoxics are dependent on individual characteristics, cementing the imposition of the norms of perception and valorization of the body in the structure of promoters of agribusiness. In this logic, one could talk about the alienated body, because it embodies the identity defined by agribusiness³¹. In this way, domination of rural communities imposes a specific system of social categories of perception and appreciation of individual identity, which blames the subject for exposure and forces him or her to not take care of the body, thus establishing legitimacy as an individual or member of a group by pursuing the promise of potential³¹.

This study has some limitations. To analyze the complexity of rural reality and the processes

that determine exposure to agrottoxics and health impacts, we obtained a large quantity of qualitative information and therefore some discourses were not mentioned due to the limited number of words. Discourses such as the male symbolization of agrottoxics and the aesthetics of the agroindustrial green desert, and descriptions of processes of resistance stemming from the strengthening of family agriculture as strategies to promote health and caring for pregnant women and children will be addressed by future articles.

Moreover, as Orlandi asserts¹⁶, in-depth discourse analysis requires a transdisciplinary approach, which a public health group cannot establish by itself. For future works, it is important to draw on knowledge of history, linguistics, and agricultural sciences to enrich our understanding of this complex reality and generate new platforms for transformation.

Final considerations

Interaction between structural forms that define the construction of reality transforms subjects. In the case of agribusiness and pesticide use, this interaction constitutes institutional symbolic violence. This structuring relationship defines everyday life and is evident in the discourses and practices of the peasant farmers. This article seeks to overcome the purely theoretical biological notion of exposure to agrottoxics and health impacts. In this vein, the reassessment of the health needs of rural populations from a social determinants of health perspective, enriched by critical discourse analysis, can offer critical knowledge to generate counter-discourses that help create a new approach to health promotion in rural areas.

Collaborations

JAB Piracón was responsible for study conception, defining the methodology, data analysis, and drafting the original version of this manuscript. TCB Coelho was responsible validation, supervision, and the critical revision of the article. Both authors read the manuscript and approved the final version to be published.

Funding

Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) - doctoral scholarship. Ministerio de Ciencia, Tecnología e Innovación Productiva - project code 1223-777-57906, contract 619-201.

References

1. Cortés I. La Crisis Alimentaria Mundial: causas y perspectivas para su entendimiento. *Razón Palabra* 2016; 94:611-628.
2. Martinelli R, Magalhães C, Soares L. A crítica marxista ao desenvolvimento (in)sustentável. *Rev Katálysis* 2012; 15(1):41-51.
3. Santos M. *O Espaço dividido: Os dois circuitos da economia urbana dos países subdesenvolvidos*. Rio de Janeiro: Livraria Francisco Alves; 1978.
4. Marx K, Engels F. *La ideología alemana*. Montevideo: Ediciones pueblos unidos; 1968.
5. Schwartz S. What Would The World Be Like if the Matrix of Consciousness were recognized. *Explore v* 2020; 16.
6. Almeida J. A industrialização da agricultura na usina Nova América. In: Almeida J. *A extinção do arco-íris: ecologia e história*. Rio de Janeiro: Centro Edelstein de Pesquisa Social; 2008. p. 35-56.
7. Carvalho M. “Defensivos” ou “agrotóxicos”? História do uso e da percepção dos agrotóxicos no estado de Santa Catarina, Brasil, 1950-2002. *Hist Cien Saude Manguinhos* 2017; 24(1):75-97.
8. Food and Agriculture Organization (FAO). FAOSTAT [Internet]. 2019 [cited 2020 mar 18]. Available from: <http://www.fao.org/3/y3557s/y3557s00.htm#TopOfPage>.
9. Björling-Poulsen M, Andersen H, Grandjean P. Potential developmental neurotoxicity of pesticides used in Europe. *Environ Health* 2008; 7(50):1-22.
10. Bouchard M, Chevrier J, Harley K, Kogut K, Vedar M, Calderon N, Trujillo C, Johnson C, Bradman A, Barr DB, Eskenazi B. Prenatal Exposure to Organophosphate pesticides and IQ in 7-year-old children. *Environ Health Perspect* 2011; 119(8):1189-1195.
11. Colosio C. Ethylenethiourea in urine as an indicator of exposure to mancozeb in vineyard workers. *Toxicol Letters* 2002; 134:133-140.
12. Jeyaratnam J. Acute pesticide poisoning: a major global health problem. *World Health Stat Q* 1990; 43(3):139-144.
13. Breilh J. La determinación social de la salud como herramienta de transformación hacia una nueva salud pública (salud colectiva). *Rev Fac Nac Salud Publica* 2013; 31(Supl. 1):S13-S27.
14. Betancourt O. *La salud y el Trabajo Quito: Ediciones electrónica*. FUNSD; 1995.
15. Laurell A. La Salud-Enfermedad como proceso social. *Cuad Med Soc* 1982; 19:1-11.
16. Orlandi E. *Análisis de Discurso. Principios y procedimientos*. Santiago de Chile: Editorial LOM; 2012.
17. Pechueux M. *Hacia el análisis automático del discurso*. Madrid: Gredos; 1978.
18. Bourdieu P. *O poder simbólico*. 11ª ed. Rio de Janeiro: Bertrand; 2007.
19. Van Dijk TA. El análisis crítico del discurso. *Anthropos* 1999; 186:23-36.
20. Testa M. Vida. Señas de identidad (Miradas al espejo). *Rev Salud Colect* 1997; 1(1):33-58.
21. Moya A, Benavides J. Exposición a plaguicidas y desempeño sensorial y neuromotor en trabajadores agrícolas de Sumapaz, Bogotá, Colombia. *Salud Hist Sanidad On-Line* 2020; 15(1):1-9.
22. Fontanella B. Amostragem por saturação em pesquisas qualitativas em saúde: contribuições teóricas. *Cad Saude Publica* 2008; 24(1):17-27.
23. Minayo MC. *O Desafio do conhecimento*. 10ª ed. São Paulo: Hucitec; 2004.
24. Barros T. Por uma metodologia do discurso: noções e métodos para uma análise discursiva. In: *Uma trajetória da Arquivística a partir da Análise do Discurso: inflexões histórico-conceituais*. São Paulo: Editora UNESP; 2015. p.73-95.
25. López SL, Guzmán N. Reificación. *Rev Realidad* 2008; 115:9-20.
26. Althusser L. Ideologia e Aparelhos Ideológicos de Estado: notas para uma investigação. In: Zizek S, organizador. *Um mapa da ideologia*. Rio de Janeiro: Contraponto; 1996. p. 105-142.
27. Vieira L. Saúde e espaço social. In: Nogueira RP, organizador. *Determinação Social da Saúde e Reforma Sanitária*. Rio de Janeiro: Cebras; 2010. p. 180-200.
28. Gramsci A. *Escritos políticos (1917-1933)*. México: Siglo XXI Editores; 1981.
29. Lamosa R. A Hegemonia do Agronegócio no Estado Ampliado: uma análise da Pedagogia Política da Associação Brasileira do Agronegócio. In: *Anais do XVII Encontro de História da Anpuh-Rio*; 2016. p. 1-10.
30. Gurgel AM, Guedes CA, Friedrich K. Flexibilização da regulação de agrotóxicos enquanto oportunidade para a (necro)política brasileira: avanços do agronegócio e retrocessos para a saúde e o ambiente. *Desenvolv Meio Amb* 2021; 57:135-159.
31. Bourdieu P. Notas provisionales sobre la percepción social del cuerpo. In: Alvarez F. *Materiales de sociología crítica*. Ponferrada: La piqueta; 1986. p. 183-194.
32. Mendonça SR. *Gramsci e a pesquisa histórica*. Curitiba: APPRIS; 2018.
33. Gramsci A. *Concepção dialética de história*. Rio de Janeiro: Civilização Brasileira; 1995.
34. Breilh J. *Epidemiologia crítica*. Quito: Lugar; 2007.

Article submitted 02/03/2022

Approved 13/05/2022

Final version submitted 15/05/2022

Chief editors: Romeu Gomes, Antônio Augusto Moura da Silva