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Tools of Meaning

From depictions of saints to on-line guidance for Muslims and computer filing of legal cases, old and new technologies continue to pose questions for practitioners, scholars, and believers. This collection brings together the work of social scientists, architects, lawyers, and semioticians to probe the role of technologies in law and religion. The technologies studied include architecture, art, digital technologies (ICT), documents and scriptures, disciplines, surveillance devices and regulatory signs, symbols and practices. Law and religion are studied together since they have always shared and benefited from each other's experience with technologies, from artistic representations of emperors, saints and judges, to mutual recognition of jurisdictions and certification.

Contributions by Ann Black, Peter Black, Carlo Botrugno, Patrícia Branco, John Brigham, Francesco Contini, Nadirsyah Hosen, Giovan Francesco Lanzara, Massimo Leone, Flavia Marcello, Richard Mohr, Megan Pearson, Davide Puca, Carlo Andrea Tassinari, Eric Wilson.

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Cover
Giuseppe Gargiulo, *Nel vuoto degli occhi tuoi*, 2017, installation at Liceo Artistico Statale, Napoli. Photo: Patrícia Branco, May 28, 2017.

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Tools of Meaning edited by P. Branco, N. Hosen, M. Leone, R. Mohr

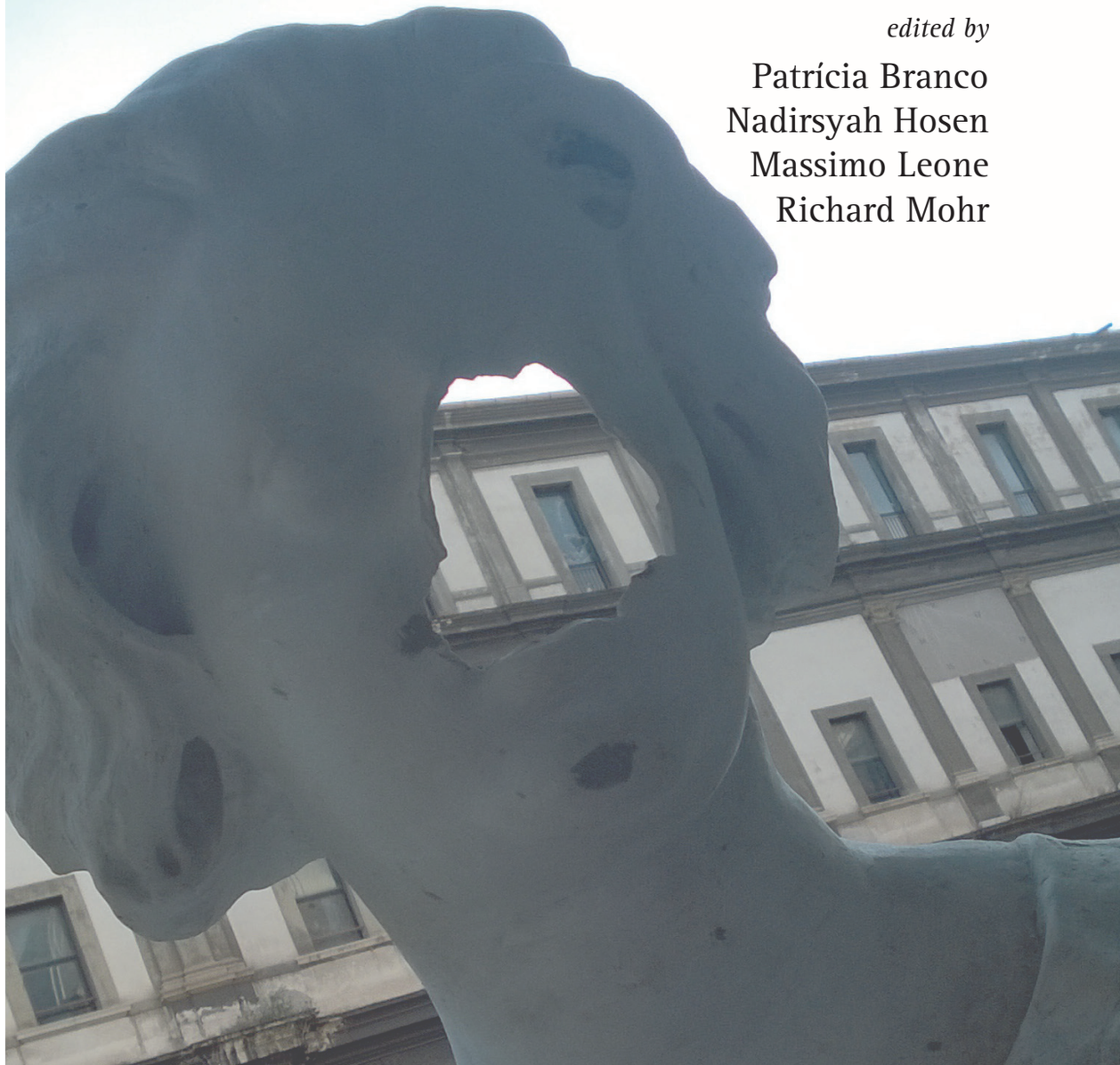
ARACNE

I SAGGI DI LEXIA
29

TOOLS OF MEANING

REPRESENTATION, OBJECTS, AND AGENCY IN THE TECHNOLOGIES OF LAW AND RELIGION

edited by
Patrícia Branco
Nadirsyah Hosen
Massimo Leone
Richard Mohr



I SAGGI DI LEXIA

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Aprire una collana di libri specializzata in una disciplina che si vuole scientifica, soprattutto se essa appartiene a quella zona intermedia della nostra enciclopedia dei saperi — non radicata in teoremi o esperimenti, ma neppure costruita per opinioni soggettive — che sono le scienze umane, è un gesto ambizioso. Vi potrebbe corrispondere il debito di una definizione della disciplina, del suo oggetto, dei suoi metodi. Ciò in particolar modo per una disciplina come la nostra: essa infatti, fin dal suo nome (semiotica o semiologia) è stata intesa in modi assai diversi se non contrapposti nel secolo della sua esistenza moderna: più vicina alla linguistica o alla filosofia, alla critica culturale o alle diverse scienze sociali (sociologia, antropologia, psicologia). C'è chi, come Greimas sulla traccia di Hjelmslev, ha preteso di definirne in maniera rigorosa e perfino assiomatica (interdefinita) principi e concetti, seguendo requisiti riservati normalmente solo alle discipline logico–matematiche; chi, come in fondo lo stesso Saussure, ne ha intuito la vocazione alla ricerca empirica sulle leggi di funzionamento dei diversi fenomeni di comunicazione e significazione nella vita sociale; chi, come l'ultimo Eco sulla traccia di Peirce, l'ha pensata piuttosto come una ricerca filosofica sul senso e le sue condizioni di possibilità; altri, da Barthes in poi, ne hanno valutato la possibilità di smascheramento dell'ideologia e delle strutture di potere… Noi rifiutiamo un passo così ambizioso. Ci riferiremo piuttosto a un concetto espresso da Umberto Eco all'inizio del suo lavoro di ricerca: il "campo semiotico", cioè quel vastissimo ambito culturale, insieme di testi e discorsi, di attività interpretative e di pratiche codificate, di linguaggi e di generi, di fenomeni comunicativi e di effetti di senso, di tecniche espressive e inventari di contenuti, di messaggi, riscritture e deformazioni che insieme costituiscono il mondo sensato (e dunque sempre sociale anche quando è naturale) in cui viviamo, o per dirla nei termini di Lotman, la nostra semiosfera. La semiotica costituisce il tentativo paradossale (perché autoriferito) e sempre parziale, di ritrovare l'ordine (o gli ordini) che rendono leggibile, sensato, facile, quasi "naturale" per chi ci vive dentro, questo coacervo di azioni e oggetti. Di fatto, quando conversiamo, leggiamo un libro, agiamo politicamente, ci

divertiamo a uno spettacolo, noi siamo perfettamente in grado non solo di decodificare quel che accade, ma anche di connetterlo a valori, significati, gusti, altre forme espressive. Insomma siamo competenti e siamo anche capaci di confrontare la nostra competenza con quella altrui, interagendo in modo opportuno. È questa competenza condivisa o confrontabile l'oggetto della semiotica.

I suoi metodi sono di fatto diversi, certamente non riducibili oggi a una sterile assiomatica, ma in parte anche sviluppati grazie ai tentativi di formalizzazione dell'École de Paris. Essi funzionano un po' secondo la metafora wittgensteiniana della cassetta degli attrezzi: è bene che ci siano cacciavite, martello, forbici ecc.: sta alla competenza pragmatica del ricercatore selezionare caso per caso lo strumento opportuno per l'operazione da compiere.

Questa collana presenterà soprattutto ricerche empiriche, analisi di casi, lascerà volentieri spazio al nuovo, sia nelle persone degli autori che degli argomenti di studio. Questo è sempre una condizione dello sviluppo scientifico, che ha come prerequisito il cambiamento e il rinnovamento. Lo è a maggior ragione per una collana legata al mondo universitario, irrigidito da troppo tempo nel nostro Paese da un blocco sostanziale che non dà luogo ai giovani di emergere e di prendere il posto che meritano.

Ugo Volli

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Definitions of «Sustainability» and «Sustainable Technology»

A Semiotic and Narrative Approach on Agricultural Regulations

Davide Puca[*], Carlo Andrea Tassinari[**]

titolo italiano: Definizioni di «sostenibilità» e «tecnologia sostenibile»: un approccio semiotico e narrativo ai regolamenti agricoli.

abstract: In this paper, we focus on food production guidelines provided by two European sustainable regulations: the European Union (EU) Organic and the Biodiversity Friend certification. Drawing upon recent developments in the study of «technologies of law», this chapter seeks to examine the role and the meaning of technology in the expanding sector of sustainable standards in food production.

Our claim is that agricultural regulations and certifications are semiotic devices which performatively define different technological systems which channel «human» and «non–human» forces in order to smooth out tensions between environmental and economic constraints. In the first paragraph, we show how crucial is the role of technology for the regulations ends. In the second, we will illustrate the general structure of european regulations and precise which actors they involve. In the third place, we show how — as metalanguage for specific technological arrangements — legal texts participate in building narratives on sustainable production, and thus shape the world they are only supposed to regulate. In the fourth and the fifth paragraph, we submit the texts of the European Union (EU) Organic and the Biodiversity Friend certification to semiotic analysis. Surprisingly, despite both regulations seek the value of sustainability, they build up very different narratives to realize it. While the EU Organic technological network aims at producing «sustainable food» by purifying nature from culture, BF produces foods, landscapes and

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connections between the farm and the environment through hybrid artifacts where nature and culture are indistinguishable.

KEYWORDS: Semiotics of Law; European Food Regulation; Organic Agriculture; Sustainability; Sustainable Technology.

1. Introduction

In this chapter, we focus on food production guidelines provided by two European sustainable regulations: the well–known and long–established European Union (EU) Organic[1] and the more recent Biodiversity Friend certification[2].

Drawing upon recent developments in the study of «technologies of law», this chapter seeks to examine the role and the meaning of technology in the expanding sector of sustainable standards in food production.

As semiotic devices, these legal texts attribute meaning to food production and, therefore, to what «sustainable food» and «sustainable technology for food production» are. As we claim, agricultural regulations and certifications performatively define different technological systems which channel «human» and «non–human» forces in order to smooth out tensions between environmental and economic constraints. Sustainable agriculture regulations take into account environmental limitations, thus, their narratives arrange different technological networks (which include actors, spaces, and inputs). Specifically, we will argue that EU Organic and Biodiversity Friend, two regulations embedded in the narrative of «sustainability», are built upon different ideas of nature, culture, technology, possible resources, threats to agriculture, and organization of farming spaces. While EU Organic envisions sustainability as a separation of humans (culture) and nature, two antagonists in competition with each other, Biodiversity Friend

1. With EU Organic we will always refer to EC Reg. 834/2007, online available athttp://eur–lex.europa.eu/legal–content/EN/TXT/?uri=celex:32007R0834. Published in 2007, latest version at the time of this article's publication.

2. Hereinafter, Biodiversity Friend will correspond to the standard's explanation in G. CAODURO ET ALII, «Biodiversity indices for the assessment of air, water and soil quality of the «Biodiversity Friend» certification in temperate areas» in Biodiversity Journal, 5 (1) 2014, pp. 69–86; the certification's «checklist» is also downloadable at www.agronomi.vr.it/pubdownload.php?id=1490; the whole certification disciplinary is available upon request on http://biodiversityassociation.org/en/biodiversity–friend/.

takes a relatively nuanced view, envisioning humans and nature as a cooperative.

Although it is not possible to offer an exhaustive account of the complex «sustainable food» phenomenon, we propose a semiotic approach to the study of food regulations.

To develop this argument, we will first explain how the regulatory mechanism of food law encompasses production and consumption of sustainable food, and why it is semiotically relevant for understanding what contemporary society means by «sustainable», and how the idea of sustainability shapes food production's technological system.

Secondly, we will take a deeper look into the components of the legal devices, establishing some common traits of the regulations.

Thirdly, we will describe our approach, which integrates legal semiotics with Actor Network Theory. This approach allows us to consider technological artifacts and legal texts as languages, the language of technology and the language of law. As we argue, technology and law are bound by a *metasemiotic* connection; as we will see, technologies appear to us as narrative units integrated in the juridical metalanguage of regulations.

In the fourth section, we will describe how the EU Organic regulation constructs a technological narrative meant to deny its own anthropic origin, but fails to reconcile the tension between productive space and environment.

Finally, we will see how the Biodiversity Friend's narrative partially solves that paradox. Contrarily to EU Organic, it recognizes the productive space as a man–controlled one, and thus manages to give a more relevant placement/positioning to biological processes in farm activities. We will see that the Biodiversity Friend's model adopts a wider idea of sustainability and sustainable technological system. Rather than referring to a vague notion of nature (as organic regulation does), it is based on a hybrid notion of environment where natural, cultural, historical and technical components are inter–linked.

2. The certifications of sustainable food production and its technological bias

Since ancient times, the main purpose of food certifications has been to safeguard the consumer's interests. For example, ancient Assyrian and Egyptian

sources show the existence of rules aimed at protecting consumers from dishonest practices in food trading[3].

In contemporary society, they play a crucial role in giving identity to the product. As Mohr and Hosen argue in the case of multi–ethnic dietary regimes in an Australian quarter, «in a complex post–industrial society, where the food chain is invisible to the consumer, the face–to–face element of trust must be replaced by trust that is certified by regulation»[4].

In other words, consumers have to rely increasingly on food labels, as a replacement for face–to–face relationship with the producer. Labels, nowadays, communicate detailed information about more (or less) tangible qualities of the products. These qualities are often guaranteed by certification systems that producers voluntarily adopt[5].

Historically, food goods have been regulated and certified to ensure the consumer hygienic and sanitary reliability, or the conformity to productive processes conferring intrinsic qualities to the product (e.g. chemical, physical and organoleptic ones).

From the nineteenth century, the environmental issue has come to be intertwined with food production[6]. From this, the modern «ecological issue» emerged. Yet, it was only from the 1970s that the conditions became mature for the progressive diffusion of an ecological paradigm, nowadays widely institutionalized and shared: that of "organic" agriculture.

Towards the end of the twentieth century, new standards certifying the environmental sustainability of food products developed and spread among producers; these standards have subsequently been associated with specific labels. Sustainability manifests itself through different indicators, usually ranging from a reduced impact on the agricultural environment, to the absence of harmful chemical residues in the processed products.

According to Lockeretz, the basis for the institutionalization of "organic" agriculture — and the subsequent explosion of production — can be found in the overlap of different contingencies:

3. Cf. C. Dankers, *Environmental and Social Standards, Certification and Labelling for Cash Crops*; Food and Agriculture Organization of the United Nations, Rome 2003 and http://www.fao.org/docrep/w9114e/W9114e03.htm.

4. In R. Mohr and N. Hosen, «Crossing Over: Hosts, Guests and Tastes on a Sydney Street», in Law Text Culture, 17, 2013, pp. 100–128 at p. 120. Available at: http://ro.uow.edu.au/ltc/vol17/iss1/6.

5. See *op. cit.* C. Danker, at p. 3.

6. *Ibid.*, C. Danker.

> Organic activists were successful in promoting their views to the public, scientists and policy makers.
> As new concerns emerged regarding the environment, the situation of farm workers and small farmers worldwide, and food safety — the last of these sometimes involving outright scandals and near–panic — organic farming became a more attractive alternative to the dominant farming systems among both farmers and the public.
> Over the decades, organic farming changed in ways that made it more appealing to a broader public, in contrast to its narrow circle of adherents in the early days[7].

Moreover, the so–called «Green Revolution»of the post–1945 era — which introduced increasingly sophisticated chemical and genetic technologies in farming fields, and reshaped the relationship between humans and food production — has induced a widespread «suspicion» concerning technological inputs in agriculture[8]:

> At the same time, a generalized rejection — or at least a greater suspicion — was developing towards synthetic chemicals of all sorts, including not just pesticides, but also food additives. This prompted growing interest in foods that were less processed and considered more wholesome, natural and safer than what was otherwise available.
> The public's concern regarding the environmental and food safety implications of agricultural chemicals was paralleled by growing concern among farmers regarding their effects on their own health and that of their families and livestock.[9]

From this point of view, issues raised by environmental sustainability in agriculture are linked to the use of industrial farming technologies. Besides, the sustainability theme has brought a wider range of producers and consumers to claim values with which they identify: survival of small

7. W. Lockeretz, «What Explains the Rise of Organic Farming?» in W. Lockeretz (ed. by), *Organic Farming. An International History,* CABI, Wallingford 2007, pp. 1–8 at. p. 3.

8. Amongst the most well–known critical views on the "green revolution" *cf.*, in part., V. Shiva *The violence of the green revolution: Third world agriculture, ecology, and politics*, University Press of Kentucky, Lexington 2016. On the link between "green revolution" and technology see D. Gollin, M. Morris, D. Byerlee, «Technology adoption in intensive post–green revolution systems». *American Journal of Agricultural Economics*, 87.5, 2005, pp. 1310–1316.

9. *Op. cit.,* W. Lockeretz, p. 5.

producers on global market, food health, environmental protection, and so forth. The main obstacle to the expression of these values is represented by agricultural industrialization and by technologies of the «Green Revolution».

Within this complex picture, two fundamental questions arise. First, if sustainable agriculture develops in opposition to the use of certain technologies, what is the sense of «sustainable technology» in agriculture? Secondly, to what extent human intervention, in a natural process, is perceived as legitimate in the context of sustainability?

The answers to these questions are different depending on various social, economic, technical, and environmental factors. Our analysis comprises the regulatory aspects of sustainable food production, and in particular the evolution of two specific European agricultural certifications: European Union Organic regulation and Biodiversity Friend.

As we will illustrate, by promoting specific technological arrangements, legal texts participate in building narratives on sustainable production, and thus shape the world they are only supposed to regulate. Furthermore, despite using the same label of «sustainability», legal texts design different strategies that lead, sometimes, to opposite models of production. Specifically, while EU Organic guidelines configure an agricultural space limited by exclusive boundaries between «nature» and «culture», the Biodiversity Friend standard creates hybrids where «nature» and «culture» cooperate.

3. Object: european agricultural certifications

The wave of public interest on environmental issues saw its peak during the 1970s and 1980s[10]. This led, on one hand, to the harmonisation of an alternative agricultural system called «organic»; and, on the other, to its increasing legal recognition.

Firstly, in many European countries organic standards were developed by private sector bodies. Later on, governments of several EU countries and Switzerland recognised a need to anchor organic techniques to legal standards, introducing legally enforceable definitions of organic production at a

10. Actualized in initiatives organised at an international level, such as the institution of IFOAM (International Federation of Organic Agriculture Movements) in 1972.

national level[11]; and, in some cases, national certification procedures and labels[12]. Eventually, the EU began to draft the legislation defining organic crop production (EEC Reg. 2092/91). This text was further updated in 2007 (EC Reg. 834/2007), which included rules for organic management of livestock[13]. EU Organic regulation represents a milestone in food certifications, overall for the shift given in turning organic from a niche to mainstream. This updated version constitutes one of the two case studies of our analysis[14].

In the years following the establishment of organic regulations on a European and global scale, a proliferation of new voluntary standards of agricultural regulation has occurred thanks to the development of a large *ad hoc* market that these policies have stimulated[15]. These new standards have emphasized different aspects of sustainability and have been developed by non–governmental bodies such as consortiums of producers, citizens associations and retailers[16].

It is on the wave of this proliferation that we place the second object indicated in our analysis: the Biodiversity Friend Regulation. This was developed by an Italian NGO[17], and focuses on sustainability through the semantic category of diversification of organic farming spaces.

The legal devices we are going to analyze share the same objectives and structure. As we already introduced, food certifications help to connect different stages of the food chain, and to transfer symbolic values from one stage to the next. In order to do this, the certification systems are structured in different parts:

11. S. Padel and N. Lampkin, «The development of Governmental Support for Organic Farming in Europe» in *op. cit.,* W. Lockeretz (ed. by), pp. 93–122 atp. 96.

12. We are focusing our attention on EU regulating history. The first state–level organic regulations, in global terms, were actually adopted in the US states of Oregon (1974) and California (1979), according to *op. cit.* C. Danker, p. 15.

13. See http://eur–lex.europa.eu/legal–content/EN/TXT/?uri=celex%3A32007R0834 and https://ec.europa.eu/agriculture/organic/eu–policy/eu–legislation/historical–background_en.

14. The whirling expansion that the European organic market has had since the '90s onwards, obviously, cannot only be related to EEC regulation 2092/91 and its latest versions, but should be included in a series of initiatives such as the funding for the conversion of agricultural activities, which we will not discuss here.

15. *Cf.* J.S. Golden *et al.*, *An overview of ecolabels and sustainability certifications in the global marketplace*, Nicholas Institute for Environmental Policy Solutions. Duke University. Interim Report Document, 10 (1), 2010.

16. See O. Chkanikova and M. Lehner, «Private eco–brands and green market development: towards new forms of sustainability governance in the food retailing» in *Journal of Cleaner Production*, 107, 2015, pp. 74–84.

17. «Biodiversity Association», based in Verona — Italy. For details: http://biodiversityassociation.org/en/.

Figure 1.

— the *certification* — commonly used as synecdoche to indicate the whole legal device; technically it corresponds to the semiotic *sanction* phase. In other words, it is a «procedure by which a third party gives written assurance that a product, process or service is in conformity with certain standards»[18];
— the *regulation* (also called *standard*, when issued by non–governmental bodies) is the normative text that contains definitions, roles, rules and guidelines that allow the entire device to work; the food producers voluntarily accept this in order to obtain certification;
— the *disciplinary* refers to the guiding part of the regulation that virtually models, through production prescriptions and prohibitions, the good that will be certified;
— the *certification label*«is a label or symbol indicating that compliance with standards has been verified. Use of the label is usually controlled by the standard–setting body. […] While the certificate is a form of communication between seller and buyer, the label is a form of communication with the end consumer»[19] (e.g. see in Figure 1 the EU Organic and Biodiversity Friend retail labels).

18. *Op. cit.*, C. Danker, p. 8.
19. *Ibid.*, C. Danker.

Furthermore, as it has been anticipated, the device involves more actors — not all in the traditional food chain. To understand how our two analytical objects work, we include four main actors:

a) the *standard–setting organism*. Here, the certification system can be developed by several different bodies:
   — governmental bodies, as in the case of the organic regulation, approved by the Council of the European Union, that we will analyze;
   — non–governmental associations — as it often happens for environmental sustainability certifications — as advocacy or stakeholder groups. This is the case of the Biodiversity Friend standard, set by the Italian environmentalist NGO, the World Biodiversity Association that we will analyze in a later section;
   — industrial actors (producers themselves, buyers, retailers, etc.);
b) the *producers*, i.e. the actors in the food chain who voluntarily decide to comply with sustainability standards. They are the first target in the *disciplinary*, that is, the production instruction system;
c) the *certification body*. A certification body assesses the fulfillment of certification standards by producers, and the conformity of processed food to the disciplinary. This is periodically controlled and certified by a third–part, itself accredited to carry out such control activity;
d) the *end–consumers*, i.e. the final actors of the chain that choose to buy the certified good, identifying themselves with its values.

3. Approach: a semiotic and narrative view on law and technology

As we have shown, many actors participate in the life of the certified food, in several different stages of the chain.

From a semiotic perspective, in each of these contexts products can be constructed in a symbolic way, depending on the meanings each actor associates with them.

Consequently, by selecting different objects of analysis — co–located in their value frame and used by specific actors — researchers analyse one of the multiple ways in which objects are symbolically constructed.

According to the tradition of semiotics of marketing and communication, many of the studies on organic food and eco–sustainable food industry have

chosen to *catch its meaning* in the final stage of the chain, the so–called *retail marke*t. The actors (also called *model users*) involved in the semiotics of the sustainable object, in this case, are the *end–consumers*. They, presumably, in a supermarket lane, *symbolically* enjoy the food product by immersing it in the micro–universe of inherent meaning, using it as a support for their moral and ethical beliefs, those of ecological consumption. Packaging is the common interface for this type of analysis. We quote the analysis of Marrone[20], Festi[21] and Ventura[22].

Our analysis concerns itself with the ways in which our two sustainable regulations connect agricultural practices with legal requirements for sustainability. Considering both agricultural practices and legal texts as languages, we will analyze their connection as a *metasemiotic*.

According to Hjelmslev, a «metasemiotic» is a language whose content plane is itslef a language[23]. The main characteristic of every language is its *twofold structure*: content and expression. He also describes a few cases in which a language speaks of another language, so that the plane of content of the first language coincide with the second language as whole.

Since the agricultural practices emerge through their regulation, and since we consider both practices and regulations as languages, we can state that the regulatory language speaks, through a specific sets of norm, of the language of agriculture. Therefore, in our objects, law is a *metasemiotic* of the practice we call «agriculture».

If we consider agricultural practice as a language, we can see how this language manipulates the reality through its own set of narratives, i.e. from «infertile» to «fertile», from «non edible» to «edible», from «raw» to «cooked», etc. Anthropology and semiotics have already observed how agriculture — similarly to cooking and other similar food production practices — represents one of the most universal and common processes that man adopts to produce symbols, culture and narrative transformations of the world[24].

20. G. Marrone, *Semiotica del gusto,* Mimesis, Milan — Udine 2016, pp. 237–256.

21. G. Festi, «Gli oggetti cultural naturali. Fermentazioni traduttive e applicazioni al mondo del vino» in G. Marrone (ed. by), *Semiotica della natura (natura della semiotica),* Mimesis, Milan — Udine 2012, pp. 233–256.

22. I. Ventura, «Nature in vendita. Il packaging dei prodotti biologici» in G. Marrone, *ibid.*, pp. 277–306.

23. L. Hjelmslev, *Prolegomena to a Theory of language,* trans. by F. B. Whitfield, Indiana University publications in anthropology and linguistics, Memoir 7 of the *International journal of American linguistics,* Supplement to vol. 19, n° 9, 1953, p. 101.

24. *Cf.* Cl. Lévy–Strauss, *The Raw and the Cooked. Mythologiques, Volume I,* trans. by John and

From a semiotic perspective, this practice, like any other, can be described in terms of *narrative programmes*, that is, chainings of actions that can be carried out by human and non–human actors[25]. In this sense agriculture represents an *action programme* in which human actors and non–human tools can *cooperate* to overcome environmental resistances and reach their food production goal.

This leads us to adopt a definition of «technology» derived from Actor–Network theory, that is not reduced to its instrumental meaning[25]. The *relational* essence of the concept of action programme helps us not to confine technology to a set of objects, nor to a scientific knowledge in building them. According to this view, the meaning of technology depends on the practice in which it is used, and it can not be reduced to objects or subjects knowledge.

In the *action programme*, as a whole, technology does not possess a universal definition. Instead, it includes variants that can reformulate its meanings in different contexts of production. Above all, the action programme is a *relationship* — a narrative relationship. This relationship is not limited to objects in themselves, but instead, venture beyond the object. It channels the forces of human and non–human actors towards a specific practice that confronts a hostile or indifferent environment[26]. As a consequence, although we will point out some changes in the use of artifacts and methods in different agriculture models, we shall mainly refer to the meaning that technological tools bear in the wider context of production. In the sense we outlined above, technological artifacts are the cornerstone of the narrative transformation agricultural practices apply to the world. In other words, technology can be considered as a narrative content of agricultural practice.

We will now debate how food certifications invent new narratives for agricultural practices, and thus reshape their social meaning[27]. Law is a *meta-*

Doreen Weightman, J. Cape, London 1969; R. Barthes, *The Empire of Signs,* trans. by R. Howard, Hill and Wang the Noonday Press New York 1992 and G. Marrone, *Semiotica del Gusto*, Mimesis, Milan — Udine 2016.

25. We are referring to the works of John Law, Bruno Latour, Madeleine Akrich and Michel Callon quoted in this chapter. See also J. Law and J. Hassard, *Actor Network Theory and After,* Blackwell, Oxford.

26. J. Law, «Technology and Heterogeneous engineering: the Case of Portuguese Expansion» in W. E. Bijker, T. P. Hughes, T. Pinch (ed. by), *The Social Construction of Technological Systems. New Directions in the Sociology and History of Technologies*, MIT Press, Cambridge 1989, pp. 111–134 at p. 115.

27. *Cf.* the concept of «Closure» in used in social constructivist approach to technological and scientific controversies: T. Pinch and W. E. Bijker, «The social construction of Facts and Artifacts: or how the Sociology of Science and the Sociology of Technology Might Benefit Each Other»

semiotic for agriculture in the sense that by allowing some technologies and restricting others for the purpose of sustainability, it rearticulates the idea of environment underlying agricultural practices. More specifically, through a particular set of norms, law refers to agricultural techniques and artifacts in order to establish standard agronomic conducts[28].

In this sense, we will highlight how our two certifications semiotically produce a normative model of the food product. The assumption is that our two texts — in particular in their *disciplinary* part (which describes the agricultural production process) — narratively construct the food object[29]. The symbolic goal of this process is the construction of an edible object which projects the value of environmental sustainability.

In sum, it is to consider the two regulations as *narrative construction programmes* for sustainable food, preceding (and to a large extent differing from) the semiotic construction that the buyer will make of the processed food product.

The fact that the two texts contain a construction programme allows us to draw a parallel between the disciplinary of agricultural production and other texts with a similar narrative structure that semiotics defines as «*programming» texts*[30]. The purpose of this narrative structure is to offer the *addressee* — in this case, the producers — a *competence* to carry out a specific action[31]. Therefore, our analysis of disciplinary texts and regulations do not focus on sanctions or adjudication. Rather, our analysis shall outline how production standards reshape the relations between production chains, human and non-human actors[32], by restructuring the role of technology in socially–conscious production methods.

in *Op. cit.*, pp. 17–50 at pp. 44–45; see also J. B. Jackson, *Semiotics and Legal Theory,* Routledge and Kaengan Paul, London and New York 1985, p. 33.

28. A. J. Greimas and E. Landowski, «Analyse sémiotique d'un texte juridique» in A. J. Greimas, *Sémiotique et sciences sociales,* Seuil, Paris, 1976.

29. *Cf.* the notion of «program of construction» in A. J. Greimas, «La soupe au pistou, ou, La construction d'un objet de valeur», in *Du sens II*, Seuil, Paris 1983, pp. 147–169.

30. *Cf.* A. J. Greimas, *Op. cit.,* 1983.

31. *Ibidem.*

32. E. Landowski, «Toward a semiotic and narrative approach to law» in *International Journal for Semiotics of Law,* vol. I, n° 1, 1988, pp. 79–105 at p. 87; according to Landowski, the primary function of legal rules isn't simply to punish, but to reorganize and reshape the identities and agencies of social actors. Simply put, one doesn't reshape food production by simply regulating social relations between human actors, but also by intervening in the technological relations that sustain production.

4. First shift: from «standard» to «organic» narrative

As we have above observed, the aim of organic regulation is to build an alternative to the old approach to production (henceforth referred to as "standard agriculture") — now considered as artificial.

If we consider agricultural production as a *technological assemblage* and, therefore, *technological assemblage* as a narrative, we can easily understand how the narrative contained in the EU Organic text is a polemic against standard agriculture. From our point of view, this basic conflict is central to understanding how organic certification works.

In general, agriculture's first objective is to produce a valuable crop for the producer, through a specific constructive programme. However, this program has many *opponents* which, according to the semiotic approach, can be considered as anti–programme agents. For their business's sake, farmers have to protect their cultivation, in order to harvest at the right time. For instance, they have to defend plants from parasites, environmental disasters, soil depletion and so on. According to the farmers' narrative programme, which is meant to produce economic value, insects represent a dangerous opponent, threatening the quality and value of food.

This narrative organisation is based on a strong *spatial programming*: as it has been noticed[33], the chain of actions involving actors and actantial positions give meaning to the spaces where they take place. Therefore, we can consider agricultural spaces as spaces of action, which are shaped by the kind of program that actants carry out.

We can also delimit the perimeter of this action space following the points of collision between a programme and its anti–programme. In other words, every agricultural system may be analyzed focusing on the way it fights any obstacle to their profits responding to a series of complex constraints.

The standard farmer — the pre–organic one — has no constraints other than running the most profitable business. So, when he/she has to protect the boundaries of the system against parasites, which he/she cannot fight with his/her bare hands, he/she turns to the most powerful ally technologies: chemical pesticides, for instance, grant him/her the power to defeat living organisms that threaten plantations.

33. M. Bronwen and R. Felizitas, *A Dictionary of Semiotics,* Cassel, New York 2000, p. 124.

According to the standard agriculture narrative, on one side these artifacts, which operate inside the production, have the role of *helpers*. On the other side, there are the antagonists of economical goods production: parasites, unexpected meteorological changes, a «poor» soil composition, and so on. These natural actors, with an actantial role of *opponents*, have to be prevented or kept outside the production area.

There is, as well, a neutral «environment» that does not support nor oppose the production. Non–threatening insects, for instance, live in this undefined space.

A contraposition between a natural, hostile environment and a culturalized production space controlled by humans is evident. As we can see, space programming, as relation between actors, actants and spaces, is what relocates boundaries between Nature and Culture, Inside and Outside, Agriculture and Environment[34]. Using a metaphor, we can compare standard agricultural space to a warfare system, more interested in what happens outside the borders than what occurs inside them.

Now, EU Organic regulation introduces an interesting shift in agricultural practices, overturning the standard narrative and its corresponding topological organization.

As first principle, EU Organic regulation states that this kind of food production has to «manage and design biological processes based on ecological systems by using natural resources which are internal to the system» and on «the restriction of the use of external inputs»[35]. In agriculture, the growth of plants is considered as a biological process; which implies that, if we have to consider the productive space of the farm as an «ecological system», all resources «for appropriate management and design» have to come from the same system. As examples of «internal inputs», the regulation mentions «living organisms», «mechanical production methods», the «practice of land–related crop cultivation»[36]. The underlying rule of this principle is that producers can use factors provided by the internal system (living organism, soil characteristics) and have to use methods that do not alter much the system itself (mechanical methods, preservation of chemical components of land).

34. C. Schwartz, F. Charvolin, B. Latour, «Crises des environnements, défis aux sciences humaines» in *Futur Antérieur* n°6, 1991, pp. 28–56 at pp. 44–45.

35. European Council, Reg. 834/2007, Title II, Article 4, (a), p. 6.

36. *Ibidem*.

The organic quality of food, according to this view, depends on the integrity of the ecological system. The regulation represents sustainable production as a process where only natural factors are permitted and where, apparently, the anthropic intervention is reduced to the minimum. As if the farmer was simply safeguarding the integrity of a production process that is, paradoxically, independent from his/her presence.

Organic regulation transforms a cultural process such as agricultural production, into a supposingly natural one, emphasising its biological part. As a result of this naturalization, management techniques have to be limited and human presence is masked.

From a narrative perspective, that implies a new distribution of roles between human and nonhuman actors. Actors previously considered as opponents, now may emerge as helpers of the ecological process, even replacing some technological tools which, vice versa, are rejected as new ecological enemies. For example:

«Insects». Before they were only considered as parasites, but now, to the extent that they are predators of other dangerous parasites, they are considered to be a "natural" substitute for chemical pesticides.

«Soil and Climate». Standard farmers cultivated plant varieties without paying too much attention to soil and climate characteristics, as long as soil and climate would allow the cultivation. Organic farmers have to consider them in order to respect the natural vocation of the land.

«Tillage tools» and «fertilizers». They represent a complex group which comprehends a wide variety of technologies for soil treatment and plants' defence. In standard agriculture, their use is indiscriminate. Organic regulation organizes and forbids them according to the level of "culturalization" they bring. This *culturalization* level corresponds to the impact they have on the ecosystem. Summarizing, we can express this homologation — of culture and impact — through a gradient, a sort of technological «escalation»: natural/manual/mechanical/motorized/chemical. For instance, «low till» techniques, like «draft–animal–power» methods are considered internal to the ecological system, whereas motorized tillage is perceived as external. A similar homologation is done for low–solubility mineral fertilizers, in opposition to chemical ones.

If the EU's view on organic production processes can be summarized as an *ideal denial of human presence* in agricultural practice, the role of technology is consequential. Insofar as technical artifacts and cultivation methods mask human presence, they are perceived as *sustainable*. On the other hand, technical

artifacts and methods which involve a sophisticated knowledge, and thus embody industrialization, are perceived as entirely non–organic — which is why GMOs and chemical products are the emblems of non–organic components[37].

The regulation doesn't only introduce a list of technological *restrictions* and *substitutions*; it also gives a sort of «special permit» that allows some «external» elements to be part of the ecosystem:

Where external inputs are required or the appropriate management practices and methods referred to in paragraph (a) do not exist, these shall be limited to:

a) inputs from organic production;
b) natural or naturally–derived substances;
c) low solubility mineral fertilizers[38].

These exceptions are given according to three main criteria:

— Firstly, the naturality, determined by the «level of anthropic origin» of the product. The less the humans participate to production, the more the object is perceived as natural. That is the way by which some external objects are transformed into internal.
— Secondly, inputs coming from a different organic space can be used. For example, fertilizers produced according to organic standards.
— And finally, only when there are no organic helpers available, then, non–natural and non–organic elements are tolerated. That happens, for instance, when organic seed varieties are not commercially available. In this case the farmer can use the standard ones.

From a semiotic viewpoint, the restrictions and substitutions imposed by EU Organic seem to be oriented by two main values: ecology and the market.

The safeguard of an internal production space satisfies the ecological objective and, at the same time, makes organic elements possible and chemical use impossible. However, the input choice offered by market may or may not justify the contingent use of non–organic elements for production's sake.

37. Cfr.: European Council, Reg. 834/2007, Title III, Chapter 1, Article 9; see above.
38. Cfr.: *Op. cit.,* Title II, article 4, comma b.; see also Title III, chapter 2, article 16.

Since ecology and the market establish *necessities, possibilities, impossibilities and contingencies* for organic food production, they embody the actantial role of *senders*[39].

Who has the priority between the two actants — the market, and the ecological system? At a first look, the exclusion of some industrial components from the agricultural space seems to privilege the authority of ecological system over market necessity. But, as we have shown, «internal» allies are not always sufficient to sustain production. When that happens, technologies, which had previously been excluded as *opponents*, are then allowed in the production programme, reaffirming the supremacy of the economical purpose.

To conclude: what can we say about the EU Organic point of view on sustainable production? The attempt of this regulation is to create a «natural» productive space, purifying the agrosystem from those opposing elements considered *too* anthropic. However, we have briefly seen how the ratio that inspired this division is arbitrary and, in many ways, ideological.

The paradoxes that derive from this *manichaean* management of ecological sustainability are many. Firstly, as we have seen, previously prohibited inputs can be retrieved to assure the ecosystem's productivity. Furthermore, the safeguard of natural processes is posed as the main concern of organic regulations, yet they never give a *positive* definition of what «nature» is. «Nature» is described as *non–anthropic*, non–industrial and non–technological. But, as a consequence, the semantic homologation of "natural" and "non–anthropic" makes the organic ecosystem a technological network under the control of the producer, who strategically controls the boundaries of her field like the standard farmer used to. In this space, even if the positive and negative definitions of natural and human have been reversed, almost all biological processes remain subordinated to the achievement of the economic objectives. And, at the end, the freedom of natural processes is dubious.

From our point of view, this list of paradoxes can be justified by the EU Organic regulation's attempt to combine a traditional agro–industrial paradigm with the anti–technological radicalism of twentieth–century ecology, which we briefly traced back in the initial excursus.

39. «An actant (person/idea) that motivates an act or causes something to happen. In other words, the sender provokes action, causes someone to act. The sender transmits to the receiver the desire to act (vouloir faire) or the necessity to act (devoir faire)». (M. Bronwen and R. Felizitas, *Op. Cit.*, p. 10).

5. Second shift: from «organic» to «biodiversity friendly» narrative

Biodiversity Friend standard[40] — laid down three years after the EU Organic regulation we referred to (EC Reg. No 834/2007) — is willing to overtake its environmental principles. However, as we will see, it is stricter on the use of industrial technology, but more permissive on the use of man–made artifacts.

We are going to see how Biodiversity Friend (henceforth referred to as «BF»):

— builds its own *positive* definition of «nature» (contrarily to EU Organic where «nature» was equal to non–anthropic);
— tries, to some extent, to develop this definition of «nature», balancing the *production narrative programme* with a *programme of natural propagation*;
— introduces a new form of sustainable space of production, through its particular *spatial programming*.

In order to illustrate the first point, we refer to the following excerpt, extracted from an article written by one of the creators of BF certification:

> The maintenance of high biodiversity in the environment must be an overriding objective for production activities, especially in the primary sector. *The agrosystem can be considered as a man controlled environment* in which the coexistence of vegetal and animal species is not characterized by stable relationship between them; therefore it can not be considered a true ecosystem. However, it represents the best possible solution to assure environmental quality and food production.[41]

BF basically criticizes the idea — contained in EU Organic law which we extensively referred to — of a production space that is, concurrently, controlled by humans and homologous to the *ecological system*.

One incompatibility BF ascribes is the imbalance between fauna and flora, in current agricultural spaces. For instance, in organic ecosystems, this

40. About Biodiversity Friend, we refer to the texts already cited in the «Introduction» paragraph.

41. G. Caoduro et alii, «Biodiversity indices for the assessment of air, water and soil quality of the «Biodiversity Friend» certification in temperate areas» *in Biodiversity Journal*, 5 (1) 2014, pp. 69–86 at p. 70.

asymmetry is kept alive by the economic purpose (that we defined as *narrative sender*): some plants and insects are allowed in the productive space only to the extent that they collaborate — or at least, that do not harm — economical value raising. So, until they're considered to be *bioticthreats*, even *natural* elements represent enemies of production, which must therefore be excluded through ally technologies. That necessarily provokes, in BF's view, an artificial selection that doesn't fit with the intrinsic properties of an ecological system.

However, BF regulation doesn't pretend to replace markets with natural vegetative propagation. Different to organic regulation, it proposes to distinguish Nature aims from Market ones, and to admit that a human–controlled space isn't equal to a natural one.

That involves a more precise definition of what Nature is. Now, an ecosystem acts according to its specific properties and agencies such as «balanced» and «auto regulated processes». Hence, the ecosystem concept expressed by BF is far more semantically complex and precise — despite in a shorter text — than the organic «ecological system».

The semantic distinction between «ecosystem» and «agrosystem» is relevant, since it gives juridical existence to an autonomous notion of nature that doesn't exist at all in previous regulations. Nature no longer is a mere production factor, but rather a *sender* actant with its own agencies such as «autoregulation» and «balance between». What's more, these ecological agencies don't deal with the production narrative programme, at least in the short–term period. Concurrently and explicitly recognizing two separated narratives, BF reduces the asymmetry caused by ideological setting in organic regulation. As mentioned above, we'll call that new programme «*animal and vegetative propagation*» (see point B above).

Now, with the same methodology as before, we're describing how these two programmes manage to coexist in a «BF space». Where does the construction of the BF object of value take place? And how can we compare it with the organic one?

Due to its autonomy, the *animal and vegetative propagation programme* occupies its own space inside agrosystems. For instance, regulation requires the preservation of at least 5% of ground to permanent woods and hedges, and encourages the creation or preservation of any existing humid surfaces. These spaces are meant to promote biodiversity by providing flora and fauna with a suitable environment for self–subsistence. That coexistence of

cultivated areas, humid surfaces, and permanent woods and hedges contributes to create an heterogenous space where productive and non productive purposes coexist. Which is entirely different from an *organic ecological system* where everything is, ultimately, economically oriented — and thus, just considered as a helper or a threat.

These heterogeneous spaces are often both materially and symbolically marked by permeable barriers such as dry stone walls. The promotion of dry stone wall buildings has several purposes. For example, they separate production spaces from animal and vegetative propagating areas. They also provide habitat to insects and hence facilitate communication between cultivated species and local fauna. In addition, they bring back naturality to a state of *tradition*, as a part of pre–industrial landscape in many regions.

Also, separated areas of the BF agrosystem are linked together by «green corridors» that, preventing habitat fragmentation, facilitate animal and vegetative hybridization and reproduction. These linkages give openness to BF spaces contrary to the organic definition of ecological system as a series of boundaries.

Besides, regulation encourages the construction of «houses for insects» that have no direct impacts on productive activities. Crossed and discontinuous, the BF space looks very different to continuous areas where organic production is set up. These actions are often called «re–naturalization», that is bringing back agricultural production areas to their supposedly natural balance[42]. Abolishing the contradiction between terms like past and future, human and non–human, the ideology of the regulation acquires a mythical function in the sense of Lévi–Strauss[43].

From our viewpoint the collaboration between humans and biological inputs in the BF space (for two different narrative objectives) produces a pretty complex technological network. Dry stone walls, «insect hotels», and so on are eminently cultural objects (see Figure 2). But insofar as these *helpers* are supposed to facilitate biodiversity proliferation, they are examples of «hybridation», and not of naturalization. Their function isn't to limit human intervention, but to maintain the communication between culturalized productive space and natural non–productive space.

42. For an example of *naturalisation* intervents see this case history: http://www.freshplaza.com/article/155568/Understanding–biodiversity–for–a–better–business.

43. Cf. C. Lévy–Strauss, *Structural Anthropology,* trans. by C. Jacobson and B. Grundfest Schoepf, Basic Books, New York, 1963, pp. 239–241.

Figure 2.

That is the exact opposite of what happens in EU Organic, where technology has to preserve the space's integrity, and architectural barriers are meant to separate organic and non–organic areas, and not to put them in communication[44].

To sum up on that topological organization, while organic space was *homogeneous*, *continuous* and *closed*, the Biodiversity Friend's agrosystem, which

44. European Council, Reg. 834/2007, Title III, Chapter 2, «Farm production», Article 11: «General farm production rules The entire agricultural holding shall be managed in compliance with the requirements applicable to organic production. However, […] a holding may be split up into clearly separated units or aquaculture production sites which are not all managed under organic production. […] Where, […] the operator shall keep the land, animals, and products used for, or produced by, the organic units separate from those used for, or produced by, the non–organic units and keep adequate records to show the separation».

includes, organizes and regroups productive and non–productive areas, results in *heterogeneous*, *discontinuous* and *open* spaces.

The topological organisation we have noted leads to a final consideration about food production. As BF regulation concerns two parallel narrative programmes (economical production and flora and fauna proliferation), its output embodies two different *value objects*. Firstly, similarly to organic regimes, BF provides a purified food object — which solves consumer's concerns about artificiality. Secondly, it attempts to integrate agriculture with its territory. Thus, even if biodiversity isn't *materially* embodied in food, that certification conveys the idea that the wealth generated by food enterprises is redistributed to protect ecological systems. In short, BF certified enterprises are supposed to enrich the environment where they are based, in both ecological and cultural terms.

6. Conclusion

In this paper, we firstly described how the development of food certification met an increasing demand for sustainability. Technological systems for food production were at the centre of the preoccupations of the consumers when that demand arose. Our aim was to clarify how sustainable food regulation responded to those criticisms.

To do so, we applied the Actor–Network Theory (ANT) to technological systems and integrated it with the semiotic approach to regulatory texts. This link is justified because in the ANT approach, the notion of technology is very similar to the semiotic notion of narrative program; that is, a chain of action where relations are more important than actors and objects, whose forces are channeled to realize an objective against hostile or indifferent circumstances. In that perspective, a technological system is simply a narrative in which relations are determined, in part, by the presence of human artifacts. This is precisely the case for agriculture — that is, above all, the association of technical, natural, human forces and resources. For this reason, we used semiotic text analysis tools to illustrate how legal regulations shape a narrative and a set of instructions concerning sustainable agriculture.

We found that every regulation builds a different narrative for sustainable production, which entails different definitions of sustainability and, conse-

quently, of sustainable technology. We analyzed those differences in terms of narrative shifts, and showed how "sustainability" is transformed at:

— a *deep semantic* level, where we observed the relations between the terms Nature/Culture
— a *nactantial* level, where we observed the changes in the structure of *programmes* and *anti–programmes* (redistribution of actantial role of helper, opponent and sender)
— a *spatial* level, where we observed that architecture of farming is reshaped by semantic, actantial and actorial transformations underlined above.

The first shift is from production that uses standard technologies to organic production. The forces participating in the narrative are highly culturalized artifacts, while the actors joining forces in the anti–programme of agriculture are natural factors ineffective for, or detrimental to production. As we argue, organic agriculture is about limiting human interventions so as to make them almost invisible. The regulations corresponding to this principle define this kind of «natural» agriculture *negatively,* as «non–anthropic». In this, technology makes up a productive space, isolated from spontaneous biological processes that pose a potential danger to production objectives. The problem of sustainability isn't thematized yet, but environment is designated as a hostile or indifferent space encircling a safe, man–controlled area.

EU Organic regulation posits a narrative based on the same Nature/Culture semantic partition we observe in standard farming methods, but inverts their meaning. Organic strategies seek to distance themselves from industrial inputs, as far as productivity constraints allow. Furthermore, they substitute these inputs with «internal», «natural» inputs from the farm, designated as autonomous «ecological system». In this sense, the EU Organic regulation confirms Marrone's point that there is an inherent contradiction in the ethos of the organic food industry. Referring to this contradiction as «hypocritical communication», he illustrates how on one hand, food is a cultural product, and culturization is a human intervention; and on the other hand, it embodies a narrative which sees human intervention as a potential abuse against nature[45].

45. G. Marrone, *Op. cit.,* 2010.

Organic agriculture thus maintains the separation of the «human» and the «natural», also inherent in the relationship between «nature» and «culture» in standard farming. This mutual exclusion has an impact on the way the EU Organic regulation «re–imagines» the farm's spatial organization. In order to be isolated and preserved from an environment already compromised by large–scale human intervention, cultivated areas have to be radically separated from the surrounding territory. This exclusion is managed by the farmer's control over the economic objectives of production. This also occurs in traditional agro–industry, which sees the environment as hostile or indifferent to agricultural enterprise.

Biodiversity Friend proposes a model of sustainability where human and nature are not in a contest against each other, but in cooperation. This partially solves the contradictions of the EU Organic regulation. In the BF model, autonomous natural processes — sometimes aided by human intervention — are granted (almost) the same status as farmer–controlled spaces of production, entailing a new, hybrid technological arrangement. In fact, the regulation not only excludes many chemical inputs whilst recruiting available inputs inside the farm, but also proposes a reconfiguration of human and non–human forces. Such reconfiguration aims at reinforcing the agency and role of natural factors in the farm, by developing a program of natural propagation, concurrent to production. We have defined the junction of these two narrative programmes as «hybridation».

As for the EU Organic model of exclusion, BF philosophy of «hybridation» is actualized in the architecture of farms and the technical components of farming. Artifacts in organic farming are employed by farmers to ensure a «natural» agriculture and thereby limit «human» intervention; thus, they overshadow human presence. Conversely, BF regulation allows «hybrid» artifacts within eco–systems, but changes their function. Their purpose is, in fact, to put in communication the natural, non productive spaces with cultural, productive ones. Not only does it portray the environment as an ally, but it is also recognizes it as an autonomous actor. This production design intertwines the economic activity within the farm with biological processes occurring both inside and outside of the productive space.

While the EU Organic technological network aims at producing «sustainable food» by purifying nature from culture, BF produces foods, landscapes and connections between the farm and the environment through hybrid artifacts where nature and culture are indistinguishable.

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