

*Final Thesis Project:*

**Poisoned Prosecco Vineyards and the Downside of an Italian Icon:  
analyses of pesticides' impact on the environment and human health**

*Master course*

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## Table of Contents

Abstract.....	4
Introduction.....	4
Methods.....	7
Background.....	7
Chapter 1: D.O.C. and D.O.C.G. Denominations.....	9
1.1. Introduction and Purposes.....	9
1.2. The New Decree.....	10
1.3. An Exponential Growth.....	11
Chapter 2: From Traditional Knowledge to Agricultural Innovations.....	13
2.1. Historical Evolution.....	13
2.2. A New Era for the Production of Prosecco.....	15
2.3. Environmental Impact.....	17
Chapter 3: Introduction of Conventional Agriculture and its Consequences.....	19
3.1. Monoculture and Loss of Biodiversity.....	19
3.2. Chemical Control of Pests: A Dangerous Agricultural Practice.....	21
3.3. Application of Pesticides on Prosecco’s Vineyards: A Threat for the Environment.....	23
Chapter 4: Pesticides Side Effects.....	25
4.1. A Harmful Substance for Human Health.....	25
4.2. Voices of Pesticides.....	28
Chapter 5: Alternative Solutions.....	30
5.1. The Introduction of Organic Wine.....	30
5.2. The Increase of Organic Prosecco.....	31
5.3. Integrated Pest Management – IPM.....	33
Conclusion.....	34
Bibliography.....	37

*“The more I learned about the use of pesticides, the more appalled I became... What I discovered was that everything which meant most to me as a naturalist was being threatened, and that nothing I could do would be more important”.*

Rachel Carson - 1962

## **Abstract**

Everyday numerous toxic and harmful pesticides are used worldwide in conventional agriculture. The purpose of this thesis is to analyse the social and environmental issues that the application of pesticides has in the production of prosecco, one of the international icons of Italian traditional wines. Conventional agriculture uses modern, and often unsustainable, practices in place of traditional knowledge. The environment became an object of exploitation to respond to an increasing demand of prosecco. The expansion of vineyards, the predominance of monoculture and the use of chemicals have led to a loss of biodiversity. The application of pesticides is the most spread practice and it is also one of the most harmful for the environment and human health. Through field observations and interviews carried out in the area, in this paper I will analyse the critical current situation that local citizens are facing because of pesticides' side effects. The thesis will also discuss the possibilities for decreasing the reliability on pesticides. It will argue that high agricultural productivity can be achieved by sustainable agriculture systems. Foreigners visit Italian artistic patrimonies and appreciate local delicious recipes. However, this same reputation is becoming the main cause of depletion of our sources and, thus, of our identity. Therefore, we all have the duty to preserve our environmental beauties and to protect our health.

## **Introduction**

In September 2016, I started my internship at PAN Europe (Pesticide Action Network)<sup>1</sup>, an international organisation based in Brussels. PAN works to minimise the negative effects of pesticides and replace their harmful use with ecologically sound alternatives<sup>2</sup>.

Among my duties as a trainee, I was particularly dedicated to a project based in the Region of Veneto, in Italy. The focus was the reduction of the application of pesticides in prosecco vineyards. When I was assigned to this project, I felt like I was brought back to my family's roots, as my father originally comes from Tarzo, a small village 8 km from Conegliano, in the Province of

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<sup>1</sup> <http://www.pan-europe.info/>

<sup>2</sup> *Ibid.*

Treviso. I was glad to work on this matter but, when I started, I would have never expected the situation to be so complicated.

Throughout this paper I will guide the reader in a tour around the hidden secrets of the beautiful hills of Conegliano and Valdobbiadene, where the production of prosecco comes from.

Prosecco is certified as a D.O.C. (Denominazione di Origine Controllata) since 1969 and as a D.O.C.G. (Denominazione di Origine Controllata e Garantita) since 2009. This research will discuss different aspects of Italian wines' certifications of guaranteed origin and quality. It will go through the changes that occurred in the last seven years, since the new decree has been introduced and the historical area of production has been promoted as a D.O.C.G. It will particularly focus on the purposes and beneficial aspects of these certifications, as well as their main contradictions. The environmental side effects and the sources' depletion that often occurs when a traditional production is exploited will be the centre of this analysis.

As the prosecco D.O.C. expanded to new areas, it became the most productive compared to all Italian D.O.C., but what is the downside of this expansion? This research will highlight the features of a new era of production of prosecco and it will focus on the loss of traditional knowledge in favour of modern agricultural practices, which have brought to a radical change both in terms of values and in terms of quality.

The spread of monoculture and the subsequent loss of biodiversity will be carefully examined in order to introduce the core of this research: the application of pesticides. In addition, other environmental changes will be introduced. Old vine's varieties have been replaced by Prosecco's one, renamed Glera, and most of them have been lost. Vineyards have been planted on lowlands, even though these areas are not suitable with the production of prosecco. Hills have also been deforested in order to leave space to vineyards, causing numerous complaints from the local people.

A brief introduction to pesticides in the general sense of the word will be discussed and the environmental impact that they had in the area will be carefully analysed. In conventional farming,

pest and weeds are managed with chemical insecticides and herbicides. Since their introduction, environmental quality and human health have been threatened by the use of these compounds.

By means of researches led by PAN Europe, this paper will then analyse some of the alternatives to the use of pesticides, known as integrated pest management. It will also focus on the benefits of organic agriculture and the difficulties it has to deal with. The gradual introduction of the organic wine trade and the spread of organic producers in the area of prosecco will also be presented.

Lately, this paper will report the harmful effects of pesticides on human health through the voices of local people and environmental activists. It will highlight the presence of tensions between citizens and wine farmers and between conventional wine farmers and organic ones. The research will report several testimonies collected during field observations of people who have been involved since many years in a “fight against the “Mafia of vines”<sup>3</sup>.

The aim of this research is to have a positive approach to the analysed matter. The topics that will be examined are very unpleasant but the purpose is to suggest possible solutions through a critical approach. During the visits, I heard stories that made me ashamed for those people who are affected by these issues. I also felt desolate for the lack of respect for our environmental beauties. All these questions made me reflect that we have to do something to make a change in this global food’ system. Instead of exploiting sources, we should all contribute to protect them in order to be able to show to future generations Italian outstanding patrimonies. As an Italian, as a citizen of this wonderful country, and as my surname recalls me to my Venetian origins, I decided to devote this work to talk about prosecco from a different perspective. I hope this paper will make all of us reflect about the importance of founding a balance between human needs and the environmental sources.

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<sup>3</sup> Interview with a victim of pesticides, October 2016.

## **Methods**

A data collection framework was designed to gather testimonies about the critical contexts local people have to live in, the challenges they face, their ideas for solutions and knowledge exchange tools that are currently used. During the internship, I went visiting the area and I met producers, families, and victims of pesticides. I was also introduced to the main actors of local protesting campaigns that are fighting against the dangerous overused application of pesticides. Throughout their voice, this paper attempts at reporting these stories as more impactful as it could.

Next to the fieldwork, different books and articles related to pesticides were used to provide a background for this study. The internship at PAN Europe helped me to become aware about this topic and, through their studies and campaigns, I could understand the controversies that are often related to the agricultural application of chemical pesticides.

I also attended several conferences at the European Parliament and the European Commission where different parties were invited to defend their case. Debates about pesticides legislation in the European Union (EU) provided me detailed insights into the pros and cons of pesticides and the weakness of the current pesticide environmental risk assessment procedures. Through a wider perspective, it was then easier to deal with the specific case of prosecco and the issues that are causing severe and even life-threatening conditions to local people.

I have also used many local and national newspaper's articles that have been published in the last years. By following the chronology of these articles, I could get an idea of how the situation is evolving and the main hurdles the proposal ban of pesticides is facing.

## **Background**

In the Region of Veneto viticulture has very ancient roots. The first quotation about the production of prosecco dates back to 1593. The author, the English gentleman Fynes Moryson who travelled around the Nord of Italy, quoted:

*« Histria is devided into Forum Julii, and Histria, properly so*

*called (...). Here grows the wine Pucinum, now called  
Prosecho, much celebrated by Pliny »*  
Moryson -1617

The area is located in the Province of Treviso and originally it extended on a hilly landscape between the towns of Conegliano and Valdobbiadene. These names might sound familiar to all of us because of the *Prosecco D.O.C.* certification, which dates back to 1969, and the recent *Conegliano Valdobbiadene D.O.C.G.* certification, which dates back to 2009. Since 2009, the area expanded, including also the Region of Friuli Venezia Giulia in the production.

The area around of Conegliano and Valdobbiadene is characterized by hills with altitudes that differ from 100 to 500m above the sea level. Hills extend from East to West and especially the southern side is particularly sun exposed. Thanks to the position between the Alps and the sea, this area benefits of a mild climate with an annual average of 12.3°C and a constant wind. The altitude, the sun exposure, the frequent rainfall and the mild climate are all crucial elements for vineyards' cultivation. The result is a grape with balanced levels of sugar and sourness and with an outstanding presence of aromas<sup>4</sup>. The soil is mainly calcareous and it is characterized by a scattered presence of clay, which contributes to keep the soil hydrated. The ground is stable and resistant thanks to deep plants' roots and the risks of soil sealing and run-off are limited<sup>5</sup>. In the past, the area was characterized by an incredible biodiversity thank to the presence of the Soligo River but as monoculture and the use of chemicals have been introduced, this richness has significantly decreasing<sup>6</sup>.

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<sup>4</sup> <http://www.prosecco.it/it/territorio/>.

<sup>5</sup> *Ibid.*

<sup>6</sup> Mongera A, *Il Bacino del Soligo tra eredità storica e opportunità ricreative*. In: Tesi di Laurea, Università degli Studi di Padova, 1996-1997.



*“In any case, monocultures have a negative impact on biodiversity and on the landscape and there won't be any difference if it is a monoculture of corn or of any other orchard”<sup>7</sup>.*

Nowadays, hills are completely covered by vineyards and mainly focused on the to the production of prosecco.

## **D.O.C. and D.O.C.G. Denominations**

### ***Introduction and Purposes***

*Denominazione di Origine Controllata (D.O.C.)* is an Italian brand that certifies the area of origin and limits the targeted grapes' harvesting. The Region of Veneto accounts the highest production of D.O.C. and D.O.C.G. wines, thanks to the widespread production of *Prosecco D.O.C.* and *Conegliano Valdobbiadene D.O.C.G.* The historical area of production of prosecco acquired the D.O.C. denomination (Denominazione di Origine Controllata) of *Prosecco di Conegliano e Valdobbiadene* in 1969. Historically, the area expanded for a total of 20.000 hectares<sup>8</sup> and the selected vine was the white Prosecco, nowadays known as Glera. These certifications remark a quality product whose characteristics are related to the environment and human labour, done according to specific regulations. In his work *Il Paesaggio degli Uomini*, Turri E. clearly describes the principles of these certifications:

*With knowledge we have denominations. The environment is recognized for its features and its possible functions, according to the reasons it has been denominated, baptized. The assigned name reflects the features that are recognized by the all group and it is necessary for its local citizens to communicate between each other.*<sup>9</sup>

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<sup>7</sup> Direzione Urbanistica e Paesaggio Veneto, *Esercizi di paesaggio 4*. In: Dossier di candidatura all'iscrizione nella lista del patrimonio mondiale Unesco 2010, Consorzio Conegliano Valdobbiadene Prosecco Superiore e dalla Regione Veneto, 2011.

<sup>8</sup> Zanchetta L, *La comunicazione collettiva del Prosecco D.O.C.* In: Tesi di laurea, Università degli Studi di Udine, Udine, 2002, Capitolo quarto, *Il Consorzio di Tutela del Prosecco di Conegliano e Valdobbiadene D.O.C.*

<sup>9</sup> Turri E, *Il paesaggio degli uomini*. In: Zanichelli, Bologna, 2005, pag. 112.

As Turri mentioned, a geographical denomination is the awareness of the area's particularity and it becomes a matter of identity for local people.

During the production stage, a D.O.C. wine has to be submitted to an organoleptic exam that certifies that the wine respects the prerequisites established by the disciplinary. In case the wine misses on of these principles, it cannot be commercialized as D.O.C.

### ***The New Decree***

The regulation of production of *Prosecco D.O.C.* hasn't changed until 2008. In July 2009, with a new decree, the historical area of D.O.C. production upgraded and achieved the D.O.C.G. denomination (Denominazione di Origine Controllata e Garantita), named *Conegliano Valdobbiadene D.O.C.G.* The new D.O.C.G denomination maintained the previous D.O.C. borders but, despite the previous denomination, the production of prosecco D.O.C.G. has to be controlled from the vine to the bottle. There are more restrictions in terms of sparkling process and bottling, which have to be done only in canteens in the Province of Treviso<sup>10</sup>. Once the wine passed all the controls, the certification has to be reported on the label in order to inform the consumer.

The second main novelty about the new decree concerns the name of the vine's variety selected for the production of prosecco. As of 2009, it is no longer defined as "Prosecco" but it is recognized as "Glera", an origin's synonymous. The purpose is to protect the final product from falsifications that frequently occurred in the last few years. Minimum 85% of the D.O.C.G. production has to be made with Glera vine variety.

The third innovation, and the most important one, is the extension of the D.O.C. denomination to new areas: both in the Region of Veneto and Friuli Venezia Giulia.

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<sup>10</sup> Consorzio di Tutela del Conegliano Valdobbiadene Prosecco Superiore D.O.C.G. (<http://www.prosecco.it/it/>)

## *An Exponential Growth*

Data reports that this outstanding growth had earliest roots and it began 10 years ago. Between 1990 and 2000, D.O.C. area increased of 32% and grape's production of 50%. In ten years the annual output had a positive increase of 9% and in 2000 there were 3.932 hectares of vine trees registered as D.O.C., with an overall agricultural area of 20.000 hectares<sup>11</sup>.

A research led by *CIRVE* calculated that in 2009 there were 9.200 Prosecco's D.O.C. vine hectares and in 2011 they almost doubled until 17.100 hectares. As for the D.O.C.G. vine hectares, the growth was more moderate and, while in 2009 there were 6.100 vine hectare, in 2011 they increased to 6.200<sup>12</sup>.

	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Totale DOC</b>	<b>9.200</b>	<b>12.600</b>	<b>17.100</b>
<b>Vigneti in produzione</b>	4.500	5.500	6.800
<b>Vigneti al 3°anno (100%)</b>	1.000	1.300	2.400
<b>Vigneti al 2° anno (60%)</b>	1.300	2.400	3.400
<b>Nuovi impianti</b>	2.400	3.400	4.500
- <i>barbatelle</i>	2.100	3.100	2.500
- <i>sovrainnesti</i>	300	300	600
- <i>vasetti</i>			1.400
<b>Totale DOCG</b>	6.100	6.200	6.200
<b>DOC + DOCG</b>	15.300	18.800	23.300

*The evolution of Glera vines between 2009 and 2011 in the D.O.C area. Data in: evaluation CIRVE based on data from AVEPA, ERSA, Nurserymen and winegrowers, 2011.*

Compared to all Italian D.O.C., the production of *Prosecco D.O.C.* became the most productive and extended one. An article from *La Tribuna* that dates back to 2010 compared Italian D.O.C.'s productions, with outstanding results:

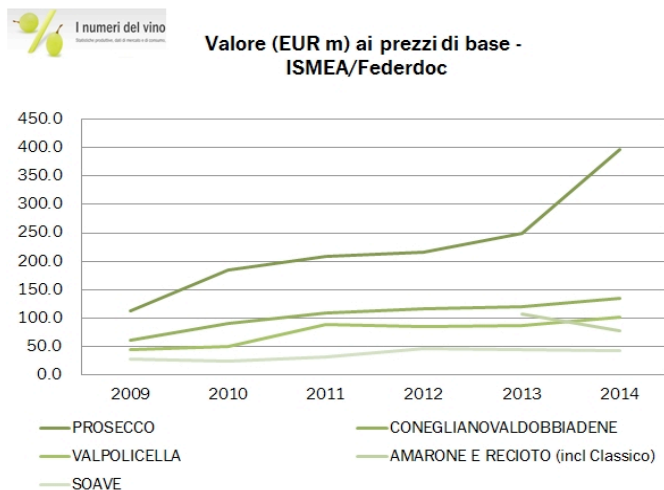
<sup>11</sup> Zanchetta L, *La comunicazione collettiva del Prosecco D.O.C.* Udine, 2002.

<sup>12</sup> Data from CIRVE based on the evaluation of data from AVEPA, ERSA, Nurserymen and winegrowers, 2011. In: Evaluation data from AVEPA, ERSA, Nurserymen and winegrowers cured by Banca dati del Centro Studi CIRVE, Conegliano, (TV), 2011.

Le D.O.C. d'Italia			
		Ettari	Ettolitri
1	Prosecco Doc	11.600	1.149.000
2	Montepulciano	11.786	845.491
3	Chianti	15.179	809.833
4	Asti	9.733	688.083
5	Soave	5.859	574.173
6	Trentino	5.956	506.155

Comparison between the Prosecco D.O.C. and other Italian D.O.C. In: *La Tribuna*, 2010.

In five years, since 2009, Prosecco increased of 21% in terms of quantity and 29% in terms of value, despite other regional D.O.C. that had a more moderate increase. According to *Federoc*, the National Confederation for the protection of Italian wines' denominations, in the same year the regional production of D.O.C. wines accounted 4.8 millions of hectolitres. This data disagreed the 4.2 millions reported by *ISTAT* as it also considered the production of prosecco in other regions. Out of these 4.8 millions, the production of prosecco amounted to 2.2 millions. *Federdoc* also reported that *Prosecco D.O.C.* reached a productive value at basic prices of 400.000 euro, three times higher than *Conegliano Valdobbiadene D.O.C.G.*, which accounted 135.000 euro<sup>13</sup>.



Increase of prosecco's value between 2009 and 2014. Data reported by: *I numeri del vino*.

<sup>13</sup> Data from *I numeri del vino* (<http://www.inumeridelvino.it/2016/07/veneto-produzione-e-valore-vini-doc-2014.html>) based on the evaluation of data from *Federdoc* and *ISTAT*.

*Every day, in the world, more than a million of bottles of prosecco are opened. 500 millions are sold per year, 400 as D.O.C. and 85 as D.O.C.G., with a turnover of 2.5 billions. 15.000 wine farms and 527 canteens work for the production of prosecco.*<sup>14</sup>

Hence, considering these numbers, we can easily understand the reasons of the growing request of new vineyards, which had to expand to the Region of Friuli Venezia Giulia, the new D.O.C. area. Gianluigi Salvador, member of the local *WWF Altamarca*, *PAN Italia* and activist against the “Prosecco’s industry”<sup>15</sup>, clearly described the current situation. As he mentioned, “if you have a tour around that area, mainly in the lowlands, you can see that old vines have been sheared and grafted with new Prosecco’s vines”<sup>16</sup>. D.O.C. vines’ growth had a tremendous impact on the environment, which became a sort of exploited “object” rather than a source that has to be preserved.

Consequently, it is difficult to think about a qualitative agriculture and protection of public health, behind façade declarations.<sup>17</sup> As we can see in this case study, geographical denominations often end up to be controlled by marketing strategies that profit of the local sensibility for the environment through the territorial promotion. On one side these certifications recognize the *terroir* for its uniqueness and aims at restricting the production to a specific area because of its qualities. On the other side, in order to face a growing request, the regulation enables the D.O.C. to expand to new areas, often not suitable for vineyards.

## **From Traditional Knowledge to Agricultural Innovations**

### ***Historical Evolution***

In terms of techniques applied, science replaced traditional knowledge. The two founders of the *Società Enologa Trevigiana*, Angelo Vianello and Antonio Carpenè, predicted this event in their

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<sup>14</sup> Collodet M, *Processo al Prosecco in tv. Il territorio: «Tante falsità»*. Article published in: *Il Gazzettino*, Venezia, 16 novembre 2016.

<sup>15</sup> Interview with Gianluigi Salvador, October 2016.

<sup>16</sup> *Ibid.*

<sup>17</sup> Bindi G, *Bollicine e pesticidi*. Article published in: *Terra Nuova*, Firenze, dicembre 2016.

masterpiece *La vite ed il vino nella provincia di Treviso*<sup>18</sup>. The book provides a perspective of viticulture at the end of the XIX century. The writers considered that the area could perfectly match with an intense agriculture looking for satisfying results both in terms of quality and quantity. The two authors compared science and farmers' traditional knowledge and they quote:

*“Our farmers practice agriculture according to the traditional knowledge they tenaciously preserved. If the owner asked them to innovate... they were hardly persuaded [...] but we have a proof reported in the cryptogram that they are finally persuaded by the example on grapes [...]. When farmers noticed that well-done sulfur practices obtained good results for two or three years, they were convinced, and now, as soon as the owner ask for it, farmers resort to using sulfur”.*<sup>19</sup>

Traditional knowledge has always been susceptible to innovations and it started being replaced by science already in the early XIX century. After two centuries, nowadays there is a big gap between conventional modern practices and grandparents' wisdom, inherited generation by generation. Also the two anthropologists Hobsbawm E. and Ranger T. mentioned that traditions have always been part of a process of change. History revealed us that traditions have often been exploited in order to guarantee the success of new practices and to introduce scientific innovations as “traditional” ones<sup>20</sup>.

The gradual abandonment that occurred in Prosecco's vines during the second post-war period had a significant impact of the transmission of traditional knowledge. Shortage of money obliged youngest generations to leave and look for a job. The migratory flow had an important impact on the environment and on vines cultivations<sup>21</sup>. When, in the '60s, immigrants returned in the area,

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<sup>18</sup> Vianello A, Carpenè A, *La Vite ed il Vino nella Provincia di Treviso*. In: Ermanno Loescher editor, Torino, 1874.

<sup>19</sup> *Ibid.*

<sup>20</sup> Hobsbawm E, Ranger T, *L'invenzione della Tradizione (1983)*. In: Einaudi, Torino, 1987.

<sup>21</sup> Dell'Anese E, Martorel P, *Il Quartier del Piave e la Valmareno. Fatti e aspetti di vita del nostro secolo*. In: Editrice Tipse, Vittorio Veneto, 1979.

their agricultural values were based on two related goals: the maximization of production and of profit<sup>22</sup>.

Professor Bevilacqua P. explained this process in his book *Storia dell'agricoltura italiana in età contemporanea*, where he quotes:

*Once the model of sharecropping family disappear, even agriculture is overwhelmed by capitalist values and, where lands have not been abandoned, uniformed and extended vineyards triumph, perfectly aligned according to a specific order, which can be explained only by rational working and harvesting processes.*<sup>23</sup>

A new era began but farmers' motivations were different and often had important consequences from many points of view.

### ***A New Era for the Production of Prosecco***

In the period after the Second World War, agricultural in the area wasn't based on monoculture yet, even though vineyards predominated, especially on the hills, while breeding farms covered the lowlands<sup>24</sup>. Since then, the environmental sources that made prosecco so notorious have been neglected and the essential bond between production and the environment disappeared. The production of prosecco has become an industrial process where plants have assumed the role of miniature factories. Vines' output has been maximized by supplying the appropriate inputs and their productive efficiency has been artificially increased<sup>25</sup>. In order to achieve these goals, new agricultural practices have been developed, without considering their long-term consequence.

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<sup>22</sup> Gliessman S, *The Ecology of Sustainable Food Systems*. In: Boca Raton, CRC Press, London, 2007, p. 3.

<sup>23</sup> Bevilacqua P, *Tra l'Europa e Mediterraneo. L'organizzazione degli spazi ed i sistemi agrari nell'Italia Contemporanea*. In: *Storia dell'agricoltura italiana in età contemporanea*, vol. 1 Spazi e Paesaggi, Marsilio, Venezia, 1989.

<sup>24</sup> Dell'Anese E, Martorel P, *Il Quartier del Piave e la Valmareno. Fatti e aspetti di vita del nostro secolo*. Pp. 188-190.

<sup>25</sup> Gliessman S, *The Ecology of Sustainable Food Systems*. p. 3.

In his book *Italia Maltrattata*, Erbani F. denounces the depletion of the Italian agricultural soil and he criticizes the systems that allowed the ruin of the local environmental sources. He reports data about the use of the arable soil in the Region of Veneto, which, between the 1961 and the 1981, exceeded the previous millenniums' total amount of cultivated soil<sup>26</sup>.

In the '80s and '90s, tourism started arising in the Region because of the beautiful landscapes and the local production of prosecco. An article from the *Quindicinale* published in 2005 describes the area as the "ideal destination for summer tourists: the *Proseccoshire*"<sup>27</sup>. The author, De Ros E., compares the Region of Veneto with Tuscany and its Chianti wine. The spread of prosecco's new reputation increased its request, with consequences on the system of production. The profitable industry of prosecco, based on standardization and entrepreneurship, becomes oriented towards worldwide exportations<sup>28</sup>.

Consequently, as reported by an article from *La Tribuna*, grapes' price drastically decreased<sup>29</sup>. Local canteens acquiring grapes set lower cost price and vine growers lost a big part of their profit. Thousands of producers were condemned to ruination and forced to abandon their livelihoods. In 2003, small size individual cultivations covered 50,5% of the total production while in 2010 32,5%<sup>30</sup>. The number of vine growers decreased from 3.100 in 2003 to 2.921 in 2011 in favour of bigger industrial cultivations "The result is the spread of industrial vines ruled by cellermen who already own D.O.C. hectares but they seek D.O.C.G. hectares for a matter of their own prestige". This is the sad reality that Gianluigi Salvador described<sup>31</sup>.

The availability of prosperous lands also got the attention of new buyers from all over the world. An article published by *La Tribuna* entitled *Dalla Vodka al Prosecco, ecco i miliardari russi*

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<sup>26</sup> Erbani F, *Italia Maltrattata*. In: Editori Laterza, 2003.

<sup>27</sup> De Ros, *La meta ideale del turismo estivo: «Il Proseccoshire»*. Article published in: *Il Quindicinale* n. 636, 7 agosto 2005.

<sup>28</sup> De Polo A, *Prosecco: il boom di esportazioni. Triplicate le vendite in dieci anni*. Article published in: *La Tribuna*, Treviso, 15 dicembre 2012.

<sup>29</sup> De Polo A, *Prosecco contro la crisi: diminuisce il prezzo dell'uva*. Article published in: *La Tribuna*, Treviso, 7 agosto 2012.

<sup>30</sup> Data from Cirve, *Distretto del prosecco doc di Conegliano e Valdobbiadene: analisi di un successo; Rapporto 2011. Dare valore alla differenza*. In: Rapporto del Centro studi di Distretto del Prosecco DOCG di Conegliano e Valdobbiadene (TV), 2011, p.27,36-37.

<sup>31</sup> Interview with Gianluigi, October 2016.



describes a flow of Russian millionaires who came to look for big industrial canteens to produce large quantities of cheap prosecco to export in their own country. Prosecco's trade became more and more unbalanced<sup>32</sup>.

### ***Environmental Impact***

In his book, Erbani F. also recalls data collected by *ISTAT* reporting that the lowlands green areas are almost saturated with vineyards<sup>33</sup>. The spread of Glera's vine brought to an intense deforestation of the area. Entire woods have been cut and in 2012, between Refrontolo and Tarzo, 40 hectares of woods have been sold and deforested to leave space to vineyards<sup>34</sup>.

“In the past vine trees were planted in respect of the environment, said Gianluigi Salvador. Today every meter of agricultural surface is deforested and exploited. Cement and big plastic tubes have been implanted using scrapers and other heavy machineries, which can shape the soil anyhow”<sup>35</sup>. Demolition wastes, such as metal tubes, tiles, rubbles and polystyrene, are reused for drainage systems.

Citizens reacted and lots of protests rose. They regret the lost of a rich environmental reporting that “the area was surrounded by woods and it has slowly been deforested. Here there was biodiversity. Here there was mulberry. There was corn. There were pastures. There were walnut trees. Today there are only vines, vines and vines”<sup>36</sup>. A group of local young musicians have been the first ones to protest against deforestation and wrote:

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<sup>32</sup> De Polo A, *Dalla vodka al prosecco, ecco I miliardi dei russi*. Article published in: La Tribuna, Treviso, 29 luglio 2012.

<sup>33</sup> Erbani F, *Italia Maltrattata*. 2003.

<sup>34</sup> De Polo A, *Bosco venduto e abbattuto «E ora pure avvelenato»*. Article published in: La Tribuna, Treviso, 11 maggio 2013.

<sup>35</sup> Interview with Gianluigi, October 2016.

<sup>36</sup> Stella G, *Il duello sul nome del Prosecco*. Article published in: Corriere della Sera, Milano, 14 novembre 2016.

*“we are sad because these fairy-tale places are disappearing, we are sorry and we want to share our sufferance for the lost of these area and their magic landscapes. We have to prevent it to happen again”.*<sup>37</sup>

*La Tribuna* reported this interview in an article published in 2012. After four years, things are not changed and local movements haven't found the way to stop the exploitation of the soil yet. Woods are “ecological corridors” that preserve biodiversity and their disappearance has tremendous consequences on the environment. Every year cement, chemical products and deforestation destroy 84,000 square km of fertile soil<sup>38</sup> and hydro-geological instability, landslides and floods become frequent and they threaten these areas<sup>39</sup>.

New vineyards have also been implanted in lowlands, even though it is well known that the cultivation of vines requires hilly soils as lowlands are too humid and water stagnation is very frequent<sup>40</sup>. This system had tremendous consequences both on the trees, which miss the right nutrients, and on the quality of the final product, which lacks of organoleptic features<sup>41</sup>. The final product is affected as the environmental conditions that make prosecco so unique are missing. However, this distinction is missing on the label and the consumer, misled by the same label, buys prosecco without being aware of its origin. In addition, the new implanted vine trees took the place of lowland cultivations, such as corn.

*In crop agriculture, specialization means monoculture – growing only one crop in a field, often on a very extensive scale [...] Monoculture is a natural outgrowth of an industrial approach to*

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<sup>37</sup> De Polo A, *Boschi rasi al suolo per il Prosecco docg Scoppia la protesta*. Article published in: *La Tribuna*, Treviso, 1 maggio 2012.

<sup>38</sup> Slow Food Biodiversity, *Difendiamo il futuro – salviamo la biodiversità!*. In: video *Slow Food Eartheart*, (<http://donate.slowfood.com/it/>), 2016.

<sup>39</sup> De Polo A, *Rifiuti abusive nel bosco inchiesta della Forestale*. Article published in: *La Tribuna*, Treviso, 12 maggio 2013.

<sup>40</sup> Interview with Paolo De Stefani, organic vine farmer, October 2016.

<sup>41</sup> Berengo M, *L'agricoltura veneta dalla caduta della Repubblica all'Unità*. In: Banca Commerciale Italiana, Milano, 1963, pp. 38-39.

*agriculture, where technology based inputs are maximized in order to increase productive efficiency.*<sup>42</sup>

Agriculture moved relentlessly towards specialization, causing a loss in terms of soil's microorganisms and biodiversity.

## **Introduction of Conventional Agriculture and its Consequences**

### ***Monoculture and Loss of Biodiversity***

In the past, the production of prosecco was based on the cultivation of several grapes varieties, which were often very different between each other<sup>43</sup>. As of the end of the XIX century, a gradual abandonment of the most unfruitful and meagre varieties began, as it happened with the *prosecco di Piave*, a variety considered too difficult to be cultivated<sup>44</sup>. A more productive and suitable grape variety was selected and the rich local biodiversity lost its importance, with a disastrous impact on ancient varieties<sup>45</sup>. Researches and studies brought to the selection of two species, more suitable with the increasing production of prosecco: a round grape – *prosecco tondo*-, and a long grape – *prosecco lungo*<sup>46</sup>. This selection marked the beginning of the “Oenological industry of Veneto, based on the standardization and the entrepreneur and management abilities”<sup>47</sup>. Nowadays, Glera variety is the most used for the production of prosecco and it replaced varieties such as Merlot and Cabernet. Glera perfectly adapts with the local frequent rainfalls, whose

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<sup>42</sup> Gliessman S, *The Ecology of Sustainable Food Systems*. p. 4.

<sup>43</sup> Biodiversità Veneto, *Prosecco, informazioni storiche*. Articolo web tratto dal sito [http://www.biodiversitaveneto.it/pagstor/h\\_prosecco.html](http://www.biodiversitaveneto.it/pagstor/h_prosecco.html), 2007.

<sup>44</sup> Biodiversità Veneto, *Prosecco, informazioni storiche*, 2007.

<sup>45</sup> Tomasi D, Cettolin C, Calò A, Bini C, *I suoli ed i climi della fascia collinare del comune di Conegliano e loro attitudine alla coltivazione del vitigno Prosecco (Vitis sp)*. In: Istituto Sperimentale per la Viticoltura, amministrazione comunale di Conegliano (TV), 2004.

<sup>46</sup> *Ibid.*

<sup>47</sup> Zalin G, *La viticoltura veneta tra la caduta della Repubblica e la Prima Guerra Mondiale. Brevi considerazioni*. In: *Il vino nell'economia e nella società medievale moderna*, Quaderni della Rivista di Storia dell'Agricoltura 1, Accademia Economico-Agraria dei Georgofili, Firenze, 1998.

unfavourable water stagnation is guaranteed by hills' inclination. It is the only vine variety recognized by the new D.O.C.G. regulation and it has to cover 85% of the total production<sup>48</sup>.

The predominance of a monoculture-based system, which swings according to the request, is one of the main responsible for the gradual loss of biodiversity. Because of such strategic choices, over the course of 10.000 years humans have raised thousand of plant varieties<sup>49</sup>. In a video entitled *Eartheart*, Slow Food quotes:

*“Every year we lose 27.000 plant and animal species, 72 a day and 3 each hour. If specie becomes extinct, it is gone forever. In just 70 years we have lost 75% of them”*.<sup>50</sup>

“Biodiversity is nature, it is life itself and it is the diversity of life, on many levels, from the smallest genes to plant and animal species”<sup>51</sup>. Threatening our biodiversity means threatening complex ecosystems, the sources of our environment and thus our lives themselves.

Beside monoculture, there are other six basic practices of conventional agriculture, such as intensive tillage, application of inorganic fertilizers, chemical pest control, genetic manipulation of domesticated plants and animals.

*Each of them is used for its individual contribution to productivity, but as a whole, the practices form a system in which each depends on the other and reinforces the necessity of using all in concert*.<sup>52</sup>

If we consider this concept expressed by S. Gliessman in his article *The Ecology of Sustainable Food System*, we will easily understand why, as an intensive cultivation led to the total havoc to the

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<sup>48</sup> Tomasi D, Cettolin C, Calò A, Bini C, 2004.

<sup>49</sup> Slow Food Biodiversity, *Difendiamo il futuro – salviamo la biodiversità!*. In: video Slow Food *Eartheart*, (<http://donate.slowfood.com/it/>), 2016.

<sup>50</sup> *Ibid.*

<sup>51</sup> *Ibid.*

<sup>52</sup> Gliessman S, *The Ecology of Sustainable Food Systems*. p. 3.

land and living creatures, and plants became more susceptible to devastating attack by specific pests and diseases. The application of inorganic fertilizer and chemical control of pests became necessary.

### ***Chemical Control of Pests: A Dangerous Agricultural Practice***

The term *pesticide*<sup>53</sup> is generically used to indicate products designed to interfere, kill or repel undesired living organism. They have been introduced after Second World War, as “scientific weapon in humankind’s war against pest and pathogens”<sup>54</sup>. Initially, they were considered as a solution for farmers to rid their fields once for all of organisms that could threaten their cultivations. “But this promise has proven to be false”<sup>55</sup>.

*Toxic chemicals commonly used in conventional agriculture threaten the safety of our food, our soil, our health, and our planet.*<sup>56</sup>

Contamination by pesticides is one of the main causes of soil degradation, meaning a “decline in the quality of soil structure, loss of fertility and erosion by wind and water”<sup>57</sup>. Although each pesticide is meant to target a certain pest, most of them can have negative side effects on non-target species and poison farmers, farmworkers and general public. Their molecules are extremely harmful for wildlife, beneficial insects (like bees and predators of insect pests) and soil’s microbial life. They can lower pest population in the short term but they also kill pests’ natural predators. Consequently, as a natural selection of the most resistant species occurs, pest population often rebound even more than before, reach even greater numbers and enhance their resistance. Farmers are then forced to use larger amounts of pesticides in higher frequency. The result is a total

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<sup>53</sup> The word ‘pesticide’ implies both the ‘active substance’ (i.e. the molecule with pesticidal effect) and the ‘plant protection production’ (PPP, i.e. the commercial formulation containing active substance and other chemicals).

<sup>54</sup> Gliessman S, *The Ecology of Sustainable Food Systems*. p. 4.

<sup>55</sup> *Ibid.*

<sup>56</sup> Christel Schaldemose – MEP, Denmark. Quotation from *2015 PAN Europe Activity Report*, Brussels, 2016.

<sup>57</sup> Gliessman S, *The Ecology of Sustainable Food Systems*. p. 9.

dependency on these substances, which is also called “pesticide treadmill”<sup>58</sup>. In the last decades, honeybees, other pollinators and birds have also been disappearing and the use of agrochemicals in agriculture is the main cause. 84% of the world’s crop diversity relies on insect pollination and almost all crops benefit from natural pest control services, permitting auxiliary insects to develop and thus to restore a natural equilibrium between helpful and harmful insects<sup>59</sup>.

*Our food sustainability is jeopardized, so is biodiversity. In fact without bees, more than 80% of the variety of the food we eat could disappear: the majority of fruits and vegetables would vanish from our tables, so would vitamins and other micronutrients.*<sup>60</sup>

Most of pesticides are toxic, persistent and bio accumulative substances. They remain on the soil, make their own way into streams, rivers and lakes – and eventually in the ocean – and can have serious deleterious effects on aquatic ecosystems<sup>61</sup>. They are assumed and stored in animals’ organisms and they end up into our food<sup>62</sup>. Residues of pesticides are constantly found in the majority of fruit and vegetable that it is then served on our tables. *The European Food Safety Authority - EFSA* recently published the results of the monitoring of pesticide residues in fruits and vegetables for the year 2013. The level of toxic mixtures in the food available on the market increased: 27,3% of all fruit and vegetables analysed contain more than one pesticide, higher than the 26,1% in 2012.<sup>63</sup>

Besides costing farmers a great deal of money, the application of these substances is becoming more common and chemistry is gradually substituting human work and agricultural traditional knowledge. Yellow and red strips spread among crops and vineyards, but also in urban

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<sup>58</sup> *Ibid*, p.4.

<sup>59</sup> Gallai N, Salles J/M, Settele J, Vaissinère B.E, *Economic valuation of the vulnerability of world agriculture confronted with pollinator decline*. *Ecol Econ* 68: 810-821, 2009.

<sup>60</sup> <http://www.pan-europe.info/campaigns/bees>

<sup>61</sup> Gliessman S, *The Ecology of Sustainable Food Systems*. p. 11.

<sup>62</sup> [http://www.legambiente.eu/documeti/2009/0521\\_dossiervari/Pesticidinelpiatto\\_05062009.pdf](http://www.legambiente.eu/documeti/2009/0521_dossiervari/Pesticidinelpiatto_05062009.pdf)

<sup>63</sup> Data reported by PAN Europe in *Food Contamination Continues* (<http://www.pan-europe.info/issues/food-contamination-continues>) and took from *EFSA Scientific Report – The 2013 European Union report on pesticides residues in food*.

areas, streets and highways. The National Action Plan (Pan), in effect since 2014, contributed to improve a little the situation but there is still a lot to do. No reduction has been settled yet and farmers are simply required to follow the instruction reported on the agrochemical product's label. Consumers have been informed about their harmful effect and some products have been banned as considered too dangerous<sup>64</sup>. However, even though there are some good proposals, in Italy their application is still elevate.

### ***Application of Pesticides on Prosecco's Vineyards: A Threat for the Environment***

In the last years the production of prosecco has been widely criticized because of the application of pesticides and the exploitation of the wine business, “an important economic activity that is becoming more and more unsustainable”<sup>65</sup>. Many articles have been published to make people aware of what is happening with this production. This research will mention just some of them to give an idea of the current situation.

In 2009 *Terra Nuova* published an article entitled *La terra avvelenata del Prosecco*<sup>66</sup>. The article reports that in 2007 3.100.855 kg of pesticides has been sold in the Province of Treviso, 4% more than the previous year. The main pesticide found in vines was a substance named “mancozeb” used against grapevine downy mildew. Data from *Arpa – Agenzia Regionale per la Prevenzione e Protezione ambientale del Veneto* - also reported that in 2007, still in the Province of Treviso, 55 tons of glyphosate have been sprayed<sup>67</sup>. Glyphosate is one of the most widely used herbicides in the world for agricultural weeding and the maintenance of urban and industrial areas and it has been qualified as dangerous to human health<sup>68</sup>.

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<sup>64</sup> Pascale G, *Pesticidi, la prudenza non è di troppo*. Articolo tratto da *Slowfood.it* (<http://www.slowfood.it/pesticidi-la-prudenza-non/>). Dati tratti da elaborazione *Piano di azione nazionale per l'uso sostenibile dei prodotti fitosanitari*, 2014.

<sup>65</sup> Bindi G, *Bollicine e pesticidi*. Article published in: *Terra Nuova*, Firenze, dicembre 2016.

<sup>66</sup> Bindi G, *La terra avvelenata del Prosecco*. Article published in: *Terra Nuova*, Firenze, agosto 2009.

<sup>67</sup> Arpa, *Fitosanitari Ambiente Salute*. In: Dati di vendita/esportazione dei prodotti fitosanitari nella Regione del Veneto, rapporto annuo 2012.

<sup>68</sup> A.Lyssimachou, *Phase out of the pesticide glyphosate*. Data published by PAN Europe in June 2016 (<http://www.pan-europe.info/resources/letters/2016/06/phase-out-pesticide-glyphosate>).

In July 2016 another article published by *WWF* confirmed that Veneto is the main national consumer of pesticides. Even though a national decrease of pesticides purchased occurred, Veneto is an exception with an annual consumption of 10kg of pesticide per hectare, despite the national average of 4,6 kg per hectare<sup>69</sup>.

According to data published by *Ispra - Istituto superiore per la protezione e la ricerca ambientale*, in Veneto pesticides residues have been found in 74,8% of cultivated areas and in 51,4% of the examined samples. While the national average of pesticides applied is 750kg per citizen per year, which is already an impressive amount, in the Province of Treviso it accounts 1,3 tons per citizen<sup>70</sup>.

Pesticides applied to fields are also easily washed and leached into surface and underground water, affecting animal populations at every level. Veneto is the third region in terms of water contamination in Italy, after Lazio and Sicily and in over 70% of the regional superficial there are residues of pesticides. In 2013 *Ispra* published the *National report of pesticides' residues in water*, mentioning the presence of frightening illegal amounts of pesticides in superficial and underground water<sup>71</sup>. The research focused on 99 substances, without including the newest substances or cocktails of substances. In 2013 the level of contamination in the regional superficial water exceeded the national limit of 23,9% and in underground water of 1,3%. In superficial water, 42 chemical substances have been found and among them, the most commons are herbicides, fungicides and insecticides. "Herbicides used in the cultivation of corn are the main polluters in the Padano-Veneto area"<sup>72</sup>, reported *Ispra*. This report also points out that, as pesticides often persist on the soil for decades, it takes many years for the environment to dispose these materials. For instance, researches have found the presence of Atrazina in water, an herbicides that has been banned in 1990. Several researches have demonstrated that these products are more harmful than

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<sup>69</sup> WWF Villorba, *Il Veneto prima regione in Italia per consumo di pesticidi*. Article published in: O.A. WWF Terre del Piave TV-BL, 28 luglio 2016.

<sup>70</sup> Bindi G, *Bollicine e pesticidi*. Article published in: Terra Nuova, Firenze, dicembre 2016.

<sup>71</sup> Nicolussi Moro M, *Pesticidi record nelle acque venete «Un campione su 4 è sopra ai limiti»*. Article published in: *Corriere del Veneto*, 10 maggio 2016. Data elaborated by: Rapporto Nazionale Pesticidi nelle Acque. Dati 2013-2014.

<sup>72</sup> Ispra, *Rapporto Nazionale Pesticidi nelle Acque. Dati 2013-2014*. (<http://www.isprambiente.gov.it/publicazioni/rapporti/rapporto-nazionale-pesticidi-nelle-acque-2013-dati-2013-2014>).



beneficial for vines. The main problem is the cocktail of substances, whose effect on the environment and human health are still unknown. *Ispra* also highlighted that agricultural practices are becoming more sustainable and the most toxic substances have been substituted with less toxic ones<sup>73</sup>.

## **Pesticides Side Effects**

### ***A Harmful Substance for Human Health***

Pesticides pose a significant human health hazard. Since they spread throughout the environment by hydrological, meteorological, and biological means, it is difficult for humans to avoid directly or indirectly exposure to pesticides.

*Food is regarded as the main source of current-use pesticide exposure in the general public. However, pesticides can also be inhaled and absorbed through the skin, particularly by people handling them directly during pesticide application or indirectly when the crop is harvested or processed.*<sup>74</sup>

Agrochemicals-farm workers and their families are certainly the most vulnerable but we, as consumers, are also exposed to dozens of different pesticides as they enter our bodies through food and drinking water. The consequences of endocrine disruptor exposure (cancer, cognitive and sexual disorders, mental disorders) are rising in society and the contribution of pesticides to these effects is likely<sup>75</sup>. In his book *Pesticides and Health Risks*, Robyan lists human health's risks related to pesticides exposure. Robyan talks about the increase of neurodegenerative damages, such as

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<sup>73</sup> *Ibid.*

<sup>74</sup> Unep State of the Science on Endocrine Disrupting Chemicals, *Human and wildlife exposure to EDCs*. Quotation from 2015 PAN Europe Activity Report, Brussels, 2016.

<sup>75</sup> Gentilini P, *Esposizione a pesticidi e esposizione per la salute umana*. In: Medicina e salute pubblica, ISDE Italia.

Parkinson, due to the consumption of contaminated water and thyroid damages due to the contact with macozeb<sup>76</sup>.

As the *Anses - French Agency for Food, Environmental and Occupational Health & Safety* studied, pesticides' molecules are extremely complex to analyse. The outcomes of these scientific studies are often too "fragmented" and "incomplete" and it turns out to be difficult to define pesticides' effects on human health<sup>77</sup>. Throughout the years some progresses have been done and between 2002 and 2010, the French organisation *MSA – La Sécurité Sociale Agricole* declared that 47 pathologies are potentially related to pesticides' exposure<sup>78</sup>. France ahead has taken a further step as, since 2012, Parkinson's disease has been included in the professional illness list that farmers might develop because of the exposition to pesticides. A direct bond between this illness and agricultural pesticides has been officially recognized<sup>79</sup>.

In 2012, *WWF Altamarca* in collaboration with the *International Society of Doctors for the Environment (ISDE)* published a manual of defence against pesticides, as a support to the people living next to vineyards and other agricultural areas<sup>80</sup>. The manual expresses particular concerns for the strong effects of pesticides on young children and unborn. Children are even more exposed to pesticides, as they are more sensible and their metabolisms do not sensitize toxic substances yet. They eat and drink more than adults and they are always in contact with the ground and they are not aware of hygiene cares. The manual suggests forbidding children to play in the gardens during the period of pesticides treatment –from April to September. Another risk is contaminated mammal milk: when directly exposed, mother's milk tends to present pesticides' residues. Pesticides also cause alterations of the germinal cells, which are then transmitted to future generations. The situation is even more frightening if we consider that three generations at once are exposed to some environmental conditions (mother, unborn child and unborn child's reproductive cells). Effects

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<sup>76</sup> Robyan C, Gyldan RN, *Pesticides and Health Risks*. In: JOGNN 2010, 39103-110.

<sup>77</sup> ANSES, *Exposure of the general population to pesticides. Evaluation of current knowledge and evaluation*. Article published in: ANSES website <https://www.anses.fr/en/content/exposure-general-population-pesticides>.

<sup>78</sup> Pascale G, *Pesticidi, la prudenza non è di troppo*. Articolo tratto da *Slowfood.it* (<http://www.slowfood.it/pesticidi-la-prudenza-non/>). Data coming from *MSA – La Sécurité Sociale Agricole*.

<sup>79</sup> <http://www.pan-europe.info/resources/newsletters/archive/newsletter-31>

<sup>80</sup> WWF Altamarca, ISDE, *Manuale per difendersi dai pesticidi*.

usually appear later, according to the typology and toxicology of the substance, the quantity and the time of exposure. In order to understand the impact that these substances have on human health, an epigenetic change must be observed in the forth generation<sup>81</sup>. According to three recent researches led by the University of Berkeley, the Mt. Sinai Medical Center and the Columbia University, children of women who have been exposed to agricultural pesticides while they were pregnant are more likely less intelligent children. In particular, pre-birth exposition to pesticides is thousand higher and there are some pesticides that cause a decrease of children's IQ since seven years old<sup>82</sup>.

The *WWF* and *ISDE* manual remarks that when farmers are spraying pesticides, they are wearing a total body protection, while the general public is directly exposed. Farmers have to duty to inform their neighbours about the treatment of pesticides at least one day before through visible signs. Moreover, farmers are required to wear protections only at that specific moment of application while it should be mandatory any time they work in vineyards, as pesticides are persistent and bio accumulative substances. Farmers should also avoid being in contact with the cultivations for two days after pesticides treatment<sup>83</sup>. Some test have been done on samples of farmers' urine after working a whole day in the vineyards and experts reported a level of contamination that is four time higher than the one tested soon after the spray of pesticides<sup>84</sup>. The *National institute of health and medical research* led a research named *Phytoner* that demonstrates part of farmers' cognitive capacities can be lost because of expositions to pesticides. Beside specific diseases, a decline of the cognitive performance, memory and mental clarity can occur<sup>85</sup>.

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<sup>81</sup> Gentilini P, *Esposizione a pesticidi e esposizione per la salute umana*. In: Medicina e salute pubblica, ISDE Italia.

<sup>82</sup> Bouchard M et al, *Prenatal exposure to organophosphate pesticides an IQ in 7-year old children*. Environ Health Perspect, 119(8):1189-95, 2011. Bradman A et al, *Determinants of organophosphorus pesticide urinary metabolite levels in young children living in an agricultural community*. Int J Environ Res Public Health, 8(4):1061, 2011. Engel SM et al, *Prenatal exposure to organophosphates, paraoxonase 1, and cognitive development in childhood*. Environ Health Perspect, 119(8):1182-8, 2011.

<sup>83</sup> WWF Altamarca, ISDE, *Manuale per difendersi dai pesticidi*.

<sup>84</sup> *Ibid.*

<sup>85</sup> Baldi I et al, *Levels and determinants of pesticide exposure in re-entry workers in vineyards*, Environmental Research Journal, 112', 60:369 Oau.

In addition, local citizens have to protect their garden in case it is close to vineyards and wash the fruit and vegetables sodium bicarbonate to make sure you clean all the residues. They also have to make sure the wine they drink has not been exposed to pesticides<sup>86</sup>.

In light of this strict guideline, it is possible to understand why locals blame pesticides for causing severe and even life-threatening conditions.

### ***Voices of Pesticides***<sup>87</sup>

While the production of prosecco increased, inconveniences and concerns for public health spread among local people. Locals started complaining and fighting the economic interests that are “slowly killing them”<sup>88</sup>. “ We lock ourselves at home because of pesticides”, said the majority of people. Vineyards are planted few meters from schools and houses, without respect for safety distances. Some people, as Luciano Bortolamiol, had to buy expensive filter systems to install at home and protect their families against pesticides. During the pesticides’ application period, families usually move to the mountains to protect their children<sup>89</sup>. In the last few year house prices collapsed while vineyards’ increased to 350-380 thousand euro per hectare. Nobody wants to live among in this area where the environmental sources are perceived as a “mine of money”<sup>90</sup>.

*From an economic point of view, we recognize the importance of the prosecco’s production, but we care more for our own heath.*<sup>91</sup>

Local movements do not entirely oppose viticulture but they look for the protection of public health and more severe regulations for prosecco canteens. A small group of women named *Le Mamme di*

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<sup>86</sup> WWF Altamarca, ISDE, *Manuale per difendersi dai pesticidi*.

<sup>87</sup> Last year, PAN Europe, in collaboration with other European NGOs, launched a project named Voices of Pesticides. This initiative aims at bringing together voices of victims of pesticides who until now are gone unheard and ignored. See link: <http://www.pan-europe.info/campaigns/voices-pesticides-around-europe>.

<sup>88</sup> Bertolucci F, *Prosecco l’aperitivo ad alta incidenza tumorale*. Article published in: Affaritaliani, 28 marzo 2012.

<sup>89</sup> De Polo A, *Prosecco, un Report di Polemiche*. Article published in: La Tribuna, Venezia, 15 novembre 2016.

<sup>90</sup> Bindi G, *Bollicine e pesticidi*. Article published in: Terra Nuova, Firenze, dicembre 2016.

<sup>91</sup> Interview with Lisa Trinca, from Le Mamme di Revine movement, October 2016.

*Revine* recently proposed a petition against harmful pesticides in order to protect children and themselves from dangerous contamination<sup>92</sup>. Also the committee *Basta Vigneti* joined the debate. Luciano De Biasi, one of the organic producers I met in Veneto and spokesman of the committee, complained that it is too difficult to cultivate an organic vineyard. Vineyards are highly fragmented and placed one next to each other and the drift of pesticides becomes more frequent. “I am obliged to sell my grapes to canteens as produced in a conventional way because of the high contamination. My efforts to cultivate according to the biodynamic method are useless and I cannot ask either for the biodynamic or biological certification. It is an economic and moral damage”<sup>93</sup>. Until last year, pesticides were also sprayed through a helicopter, a method that caused the dispersion of most of the chemical substances. The risk of pesticides’ inhalation was higher and public health was undermined. Some local movements, as *WWF Altamarca* and the *Facebook* interactive group *Rive rive, ma io arrivo vivo?* strongly opposed and since last summer campaign no helicopters have been used<sup>94</sup>.

As the application of pesticides increased, the frequency of cancer cases exploded. Between 2010 and 2011 the percentage increased of 4,9% and the worse aspect is that it is always hard to ask for these data from public institutions<sup>95</sup>. In response to the publication of the *WWF* and *ISDE* manual, which reports that in the area among each 19,7 people one of them has cancer<sup>96</sup>, the health and social agency published a communication to inform the general public that the spread of cancer cases is decreasing<sup>97</sup>. *Il Gazzettino*, a local newspaper, recently published an article reporting that in Vittorio Veneto (TR) a pharmacy specialized in supporting people affected by cancer opened. Every year, the pharmacy supports 1.200 oncological patients from the area and delivers 2.500

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<sup>92</sup> Milanese C, *Mamme di Revine preoccupate per i pesticidi, petizione on line*. Article published in: Oggi Treviso, Treviso, 21 luglio 2016.

<sup>93</sup> Cianciullo A, *Un paese contro i pesticidi, rivolta nel regno del prosecco: “Basta vigneti e solo bio”*. Article published in: La Repubblica, 7 giugno 2016.

<sup>94</sup> A.d.p., *L’elicottero dei pesticidi quest’estate resta a terra*. Article published in: La Tribuna, Venezia, 12 maggio 2015.

<sup>95</sup> Interview with Gianluigi, October 2016.

<sup>96</sup> WWF Altamarca, ISDE, *Manuale per difendersi dai pesticidi*.

<sup>97</sup> Zanardo M, Borsoi C, *Processo al Prosecco ma l’Usl lo assolve*. Article published in: Il Gazzettino, Venezia, 16 novembre 2016.

packs of medicines, for a total amount of 1.8 millions of euro per year<sup>98</sup>. Also *WWF Altamarca* collected some data and found out that in the historical area of production of prosecco the incidence of cancer's cases is three times higher than the closer areas, and the total amount of public money spent to threat cancer's cases overcame prosecco's incomes<sup>99</sup>. Even though these numbers sound impressive, some local producers deny any possible connection between them and the production of prosecco and complained that is a false alarm. They argued that there is no scientific evidence of connection between cancer and pesticides and the frequency of these diseases is accidental. "We did some researches and the results shown that there is no need to talk about an epidemiologic alarming situation. We looked for 17 toxic substances and the values are from 5 to 500 times lower the limit allowed by law<sup>100</sup>. In response, the committee *Colli Puri* led some scientific researches on several samples of prosecco's bottles. The results confirm that residues respect the national limit allowed by law. Fabio Padovan, a member of the committee, pointed out that the Italian official limit is very high. Even though pesticides' residues levels are low, their toxicity still affects our organisms. Another issue is that in the same sample residue of different pesticides have been found but there are no researches on cocktail of pesticides' effects on human health. "Local communities are still debating about what to do, while the answer should be clear. As pesticides are toxic chemical substances, their application is harmful for the environmental and for our own health", said Padovan<sup>101</sup>.

## **Alternative Solutions**

### ***The Introduction of Organic Wine***

The threats analysed throughout this paper underline the importance of moving towards more sustainable agricultural practices. As for wine production, this trend has already started few

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<sup>98</sup> Borsoi C, *Farmacia specializzata per i malati di cancro*. Article published in: Il Gazzettino, Venezia, 11 ottobre 2016.

<sup>99</sup> Data collected by WWF and reported by Gianluigi. Interview October 2016

<sup>100</sup> Collodet M, *Processo al Prosecco in tv. Il territorio: «Tante falsità»*. Article published in: Il Gazzettino, Venezia, 16 novembre 2016. Zanardo M, Borsoi C, *Processo al Prosecco ma l'Usl lo assolve*. Article published in: Il Gazzettino, Venezia, 16 novembre 2016.

<sup>101</sup> De Polo A, *Prosecco, un Report di Polemiche*. Article published in: La Tribuna, Venezia, 15 novembre 2016.

years ago. In the past organic wines were generally discredited as they were considered plain in aromas and taste compared to the conventional ones. For organic wine producers it took a long to win prejudices that they were not able to make wine. *Wine Monitor* from *Nomisma* recently reported that in the last ten years in Italy organic vineyards increased of 128%. Among every ten hectares of vineyards, one of them is organic. With a total amount of 66.578 hectares of vineyards, Italy is the second organic wine producer in Europe, after Austria. In 2015, organic wine trade gained 205 millions of euro and a third of it comes from the national trade. Organic wine consumers are increasing, at the expense of the conventional wine lovers, and their choice is mostly due to health and environmental reasons. Also qualitative reasons are considered as pesticides and fertilizers, together with additives added during the bottling process, can interfere with the final taste. In organic wines, these substances are replaced by low quantities of copper and sulphur, which contribute to preserve soil fertility and assure a better quality and less harmful final product<sup>102</sup>. Moreover, “when vines are not are not exploited, they might produce less but they are healthier and their quality is higher”<sup>103</sup>.

### ***The Increase of Organic Prosecco***

In the last years, organic viticulture spread around prosecco vineyards, even though pesticides’ drift continuously compromises the genuineness of the final product. During the visits in Veneto, I had the chance to visit some organic prosecco canteens. I met Ivo Nardi, the owner of Perlage Wines, an example of organic canteen since 1985. Perlage had the intuition of proposing a wine produced in respect of the environment and human health in a moment that organic agriculture was still at the beginning. Ivo told me that the conversion to organic agriculture has been very difficult as at that time, in the ‘80s, it was still hard to protect grapes from pests and diseases. “Initially the production drastically decreased but we had strong environmental and health

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<sup>102</sup> Data from *Wine Monitor-Nomisma* (<http://www.nomisma.it/index.php/it/press-area/comunicati-stampa/item/823-20-marzo-2015-vino-bio-nel-2015-in-crescita-il-numero-di-consumatori-italiani/823-20-marzo-2015-vino-bio-nel-2015-in-crescita-il-numero-di-consumatori-italiani>).

<sup>103</sup> Interview with Ivo Nardi, owner of Perlage Wines canteen, October 2016.

motivations and we didn't give up. We soon realized that by producing organic wine we were obtaining positive results even from an economical point of view. Productive costs increased of 30% but also selling costs did. Every year, Perlage wines' income grew of 5%<sup>104</sup>.

*There are three reasons we chose to become an organic canteen. The first one is to protect our consumers with a genuine, certified and fair product. The second one is a responsibility towards the society. We try to limit the use of chemical products that are toxic for the plant, the air and the water. We want to preserve our environmental sources and maintain what we inherited but we also want to protect public health. The third reason is addressed to other stakeholders. We want to be fair with our producers and distributors. Perlage guarantees the colour of purity, the perfume of tradition and the taste of quality<sup>105</sup>.*

Ivo was had a positive perspective of the production of prosecco and he reported that in the last years things have changed a lot, thanks to citizens committees and new regulations adopted by viticulture canteens. "The organic trade is increasing a lot in the area" and organic wines are becoming more common<sup>106</sup>. However, most of the organic prosecco is still exported, as there is not yet the culture for organic wines in Italy<sup>107</sup>. Also the Perlage Wines canteen exports 80% of its production, mainly to Germany and England<sup>108</sup>. The owner of Giol canteen also mentioned that a lot of canteens started producing organic prosecco for commercial reasons rather than environmental and ethical ones<sup>109</sup>.

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<sup>104</sup> *Ibid.*

<sup>105</sup> Data from "Azienda Perlage Srl" mission. In: <http://www.perlagewines.com/mission.html>

<sup>106</sup> Interview with Ivo Nardi, owner of Perlage Wines canteen, October 2016.

<sup>107</sup> Interview with Vittorio Carraro, owner of Giol cantee, October 2016.

<sup>108</sup> Interview with Ivo Nardi, owner of Perlage Wines canteen, October 2016.

<sup>109</sup> Interview with Vittorio Carraro, owner of Giol cantee, October 2016.



## ***Integrated Pest Management – IPM***

There are other solutions to limit the environmental impact of pesticides. PAN Europe elaborated and published a booklet entitled *IPM – Working with nature* that analyses the general principles of integrated pest management. IPM stands for a:

*durable, environmentally and economically justifiable system in which pest damage is prevented through the use of natural factors limiting pest population growth and, IF NEEDED, supplemented with other preferably non-chemical methods.*<sup>110</sup>

The idea is that sustainable biological, physical and other non-chemical methods should generally be preferred to chemical methods if they provide satisfactory pest control. There are several possible methods that prevent and/or suppress the presence of harmful organisms, such as:

- Crop rotation
- Use of adequate techniques (i.e. under-sowing, pruning, direct sowing etc.)
- Use of tolerant cultivars and standard or certified seeds
- Use of balanced fertilization, liming and irrigation or drainage practices
- Use of hygiene measures, such as a regular cleaning of machinery and equipment
- Protection and enhancement of important beneficial organism (i.e. by adequate plant protection measures).

In addition, harmful organisms should be constantly measured and, when necessary, pesticides should be applied as specific as possible for the target: the ones with the least side effects on human health, non-target organisms and the environment should be favoured. Doses should be reduced to minimal necessary levels and the frequency of their application should be controlled. There are some extreme cases where the level of harmful organisms requires repeated application of pesticides to the crop. For those cases, there are anti-resistance strategies that can be applied to maintain the effectiveness of the products, such as the use of multiple pesticides with different

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<sup>110</sup> PAN Europe, *IPM – Integrated Pest Management. Working with Nature*. Booklet published by PAN Europe, Brussels, 2016.

modes of action. Many aspects of IPM are not new and have been practiced by generations of farmers as part of routine crop husbandry. They are part of the traditional knowledge that has been lost and needs to be restored. Practices as the one previously described all contribute to build up and enhancement of soil organic matter, soil structure and water retention capacity and they have been part of good farm practices for centuries<sup>111</sup>.

## Conclusion

The production of prosecco is degrading soil fertility, without considering that it is a non-renewable resource. It is taking nutrients from the soil and shifting them far away. The more corporate plant breeding becomes, the less genetic diversity there is and, as this research analyses, it is frightening if we consider that, by doing so, prosecco will rely more and more on pesticides.

The link between decline in biodiversity on European farmland and pesticides has been among others scientifically documented. “If biodiversity is to be restored in Europe and opportunities are to be created for crop production utilizing biodiversity-based ecosystem services such as biological pest control, there must be a Europe-wide shift towards farming with minimum use of pesticides over large areas”<sup>112</sup>. Biodiversity should be preserved because, as Carlo Petrini said, “our happiness is built on biodiversity. The battle to save biodiversity is not just any battle but it is a battle for the future of the planet”<sup>113</sup>. As this thesis shows, the use of pesticides applied on prosecco production is avoidable and farmers should prefer natural preventative practices to keep the environment diversified, and soil and crops healthy. It is thus necessary to build up among consumers, farmers and stakeholders a deep eco-consciousness about an ethical way of living by benefiting of the environmental sources rather than exploiting them.

The local movements introduced throughout this paper are keen to face the huge agro-industry lobby and ban internationally accepted chemical products. It is an example that revolution

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<sup>111</sup> *Ibid.*

<sup>112</sup> Geiger et al, *Persistent negative effects of pesticides on biodiversity and biological control potential on European farmland*. In: *Basic and Applied Ecology*, 11 (2): 97, 2009.

<sup>113</sup> Slow Food Biodiversity, *Difendiamo il futuro – salviamo la biodiversità!*. In: video *Slow Food Earthearth*, (<http://donate.slowfood.com/it/>), 2016.

always starts from the bottom but, meantime, it is also necessary to involve people coming from different sectors and something has to change at a European Agricultural Level. Improved pesticide policy is necessary and feasible. Governments should all take measures to promote low pesticide-input pest management and give, where possible, priority to non-chemical methods. In this way, professional users of pesticides will switch to practices with lower risk to human health and the environment among those available. Mayors are responsible for their citizens' health and thus they should revise pesticides administration when they are potentially dangerous for human health. In order to prevent the increase of cancers, health damages should be properly managed. It is not a matter of dealing with cancers but it is a matter of preventing its spread.

Another issue is the tremendous amount of misinformation in the global food system: if you want to feed your family healthy food, you have to ask a lot of questions and it is difficult for consumers to be aware of the risk they are exposing themselves through certain products<sup>114</sup>. Even though there are maximum EU limits for pesticides in grapes, there is no reference to the final product. Moreover, the legislation on Maximum Residue Levels is not an indicator of whether something is safe or toxic but merely that the label instructions on the pesticide bottle have been followed and the pesticide has been used 'correctly'<sup>115</sup>. This means there is little or no monitoring of the amount of pesticide residue in the bottles of prosecco we drink and consumers are constantly in danger. The only safe level is zero as studies demonstrated that even small doses could have alarming effects<sup>116</sup>. Another result is spread unawareness about the unsustainability of our food system, where food is objectivized in a complex series of procedures devoid of reason and meaning, and the environment is perceived as an object of exploitation. Choosing whatever to consume or not has an immensely important act with global and environmental implications. We should always

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<sup>114</sup> Citation from Patagonia owner Ivon Chouinard. Patagonia Provisions, *Unbroken Ground*. In: Patagonia Provisions movie, Ventura (CA), 2016.

<sup>115</sup> Storck Vet al, *Towards a better pesticide policy for the European Union*. In: Sci Total Environ, 2016.

<sup>116</sup> *Ibid.*

remind that food is moral and any related issue has to be faced by establishing an “ethics and politics of good global food praxis”<sup>117</sup>.

This research aims at demonstrating that, in order to achieve change, little can be done without political action that plays an enormous influence on the food production as well as the consumer choice. It is necessary to start from the present to build up successful plans for the future because “who fights can lose but whom does not fight has already lost”<sup>118</sup>. Change cannot be radical but it requires little steps, passion and perseverance. Every one of us can do something, in our local area, every day because “success has many fathers”<sup>119</sup>.

In conclusion, we are responsible to leave this land better than how we found it and it is possible only if we all believe in the same values and if we all go in the same direction. We must not dwell on what we have ruined, but focus on what we can still save.

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<sup>117</sup> Lemke H, *The Ethics of Taste. Principles of a Philosophy of Food or a New ‘Gastrosophy’*, translated by Jason Baumer, pp. 4-5.

<sup>118</sup> Interview with Johannes, Malles Valvenosta (BZ), September 2016. In September I went visiting Malles Valvenosta a village fighting from the ban of pesticides. This was my first task with PAN Europe and it helped me to become familiar with the organisation. There, I met some local people and local producers and I led some interviews.

<sup>119</sup> *Ibid.*

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