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# Hitler's Oilseed-Growers

## Farming Styles, Agrosystems and the Nazi Food Regime in Niederdonau, 1938–1945\*

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### I. Introduction

In the conventional wisdom about agricultural development in twentieth century Austria, the Nazi era 1938 to 1945 has long been conceived as an 'interlude' or even a 'step backwards'. Many writers assessed Nazi agricultural policy as being essentially 'anti-modern': some emphasised the totalitarian character of state regulation of agriculture 1938 to 1945, doing away with the 'peasant democracy' (*Bauerndemokratie*) of the Austrian First Republic; others pointed to the overreaching agrarianism, e.g. the 'blood and soil' (*Blut und Boden*) ideology, aiming at the restoration of a seemingly pre-industrial 'peasant community'. Both lines of argumentation led to the conclusion that Austrian agricultural development stagnated or even declined in the Nazi era due to more

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extensive uses of land and livestock, sometimes interpreted as an outcome of peasant resistance.<sup>1</sup> From a philosophy of history's point of view, this historical image seems to be (at least in part) a discursive projection. Both Nazi totalitarianism and agrarianism represent 'the other' of the speaker's own 'meta-narrative', namely the making of the democratic and industrial – in short, 'modern' – society of the Austrian Second Republic as an anti-thesis to the 'Third Reich'.

I would not deny the totalitarian and agrarianist tendencies of the Nazi regime at all; but what in my view needs to be challenged, is the conclusion about its 'anti-modern' nature.<sup>2</sup> The classical notion of 'modernity', narrowed towards the one-way street of democratisation and industrialisation, needs to be widened by a more reflexive notion. According to Shmuel N. Eisenstadt's concept of 'multiple modernities',<sup>3</sup> modernisation inherits a particular *ambivalence*, allowing more than one pathway of societal transformation: besides the 'normal' (i.e. Western) route to liberal-democratic modernity, alternative ways of modernisation – including fascist ones<sup>4</sup> – become thinkable. Whereas the classical notion of 'modernity' excludes Nazism by definition, the reflexive notion opens up an intellectual space for a more accurate assessment of the '(anti-)modern' character of the Nazi regime in general and its agricultural policy in particular.<sup>5</sup>

This article makes use of the intellectual space widened by the notion of the ambivalence of modernity. It discusses the impact of the Nazi era on agricultural development in twentieth century Austria by focusing on the state-led production campaign for oilseeds from a doubly perspective: the 'macro-project' of the Nazi food regime on the one hand (II.) and the 'micro-projects' of agrosystems and farming styles on the other hand (III.). *Food regimes* are institutionalised interrelations between a particular mode of accumulation of resources and a particular mode of regulation by societal actors.<sup>6</sup> *Farming styles* are internally coherent and

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<sup>1</sup> For a 'classical' expression of this argument see Ferdinand Tremel, *Wirtschafts- und Sozialgeschichte Österreichs. Von den Anfängen bis 1955*, Vienna 1969, 390 f. The wartime extensification is also stressed by a more recent account: Michael Mooslechner/Robert Stadler, *Landwirtschaft und Agrarpolitik*, in: Emmerich Tálos/Ernst Hanisch/Wolfgang Neugebauer (eds.), *NS-Herrschaft in Österreich 1938-1945*, Vienna 1988, 69-94.

<sup>2</sup> See Ernst Langthaler, *Eigensinnige Kolonien. NS-Agrarsystem und bäuerliche Lebenswelten 1938-1945*, in: Emmerich Tálos et al. (eds.), *NS-Herrschaft in Österreich 1938-1945. Ein Handbuch*, Vienna 2000, 348-375, here 371 f.

<sup>3</sup> See Shmuel N. Eisenstadt, *Multiple Modernities*, in: idem (ed.), *Multiple Modernities*, New Brunswick, NJ 2002, 1-30.

<sup>4</sup> See Roger Griffin, *Modernism and Fascism. The Sense of a Beginning under Mussolini and Hitler*, Basingstoke/New York 2007.

<sup>5</sup> For an overview on the debate on Nazism and modernisation see Riccardo Bavaj, *Die Ambivalenz der Moderne im Nationalsozialismus. Eine Bilanz der Forschung*, Munich 2003; idem, *Modernisierung, Modernität und Moderne. Ein wissenschaftlicher Diskurs und seine Bedeutung für die historische Einordnung des „Dritten Reiches“*, in: *Historisches Jahrbuch* 125 (2005), 413-451.

<sup>6</sup> See Philip McMichael, *A food regime genealogy*, in: *Journal of Peasant Studies* 36 (2009), 139-169.

externally distinctive ‘modes of ordering’ of *agrosystems*,<sup>7</sup> comprising ‘socio-technical networks’ of symbolic (e.g. self-images), social (e.g. kinship ties) and material elements (e.g. landed property).<sup>8</sup> The central question this article aims at answering is how the Nazi regime’s ‘macro-project’ was related to the farm holders’ ‘micro-projects’. By exploring the peculiarities of the actor-network emerging around wartime oilseed-growing, the ‘(anti-)modern’ character of Nazi agricultural policy in German-annexed Austria is being re-assessed in the light of this case study (IV).

## II. The Nazi food regime as a ‘macro-project’

The assessment of the food regime established by the Nazi government in Germany since 1933 is usually focused on the preparation of the war of aggression.<sup>9</sup> However, this view seems to be too narrow; from a broader perspective, leading decision-makers in the agrarian apparatus of the ‘Third Reich’ aimed at fundamentally reordering the interwar food regime at a European level.<sup>10</sup> After the disruptions of agricultural trade in the First World War, the prewar global food regime under British hegemony, based on the delivery of agricultural products from overseas white settler colonies to European industrial states, had been restored.<sup>11</sup> From the 1920s onwards, also Germany had become highly dependent on food imports, especially feeding stuffs used for livestock farming.<sup>12</sup> According to the agrarian top-level functionary Herbert Backe, who by and

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<sup>7</sup> See John S. Caldwell, *Farming Systems*, in: Charles J. Arntzen / Ellen M. Ritter (eds.), *Encyclopedia of Agricultural Science*, vol. 2, San Diego et al. 1994, 129-138.

<sup>8</sup> For a theoretical outline and an empirical application of the farming styles concept see Jan Douwe van der Ploeg, *The Virtual Farmer. Past, Present and Future of the Dutch Peasantry*, Assen 2003, 101-141. For a critical assessment see Frank Vanclay et al., *The Social and Intellectual Construction of Farming Styles: Testing Dutch Ideas in Australian Agriculture*, in: *Sociologia Ruralis* 46 (2006), 61-82.

<sup>9</sup> For an overview see Gustavo Corni/Horst Gies, *Brot, Butter, Kanonen. Die Ernährungswirtschaft in Deutschland unter der Diktatur Hitlers*, Berlin 1997; Gustavo Corni, *Hitler and the Peasants. Agrarian Policy of the Third Reich*, New York 1990; John E. Farquharson, *The Plough and the Swastika. The NSDAP and Agriculture in Germany 1928-1945*, London/Beverly Hills 1976; from a regional perspective: Daniela Münkler, *Nationalsozialistische Agrarpolitik und Bauernalltag*, Frankfurt am Main/New York 1996; Theresia Bauer, *Nationalsozialistische Agrarpolitik und bäuerliches Verhalten im Zweiten Weltkrieg. Eine Regionalstudie zur ländlichen Gesellschaft in Bayern*, Frankfurt am Main 1996; Beatrix Herlemann, „Der Bauer klebt am Hergebrachten.“ *Bäuerliche Verhaltensweisen unterm Nationalsozialismus auf dem Gebiet des heutigen Landes Niedersachsen*, Hannover 1993.

<sup>10</sup> See Adam Tooze, *The Wages of Destruction. The Making and Breaking of the Nazi Economy*, London 2006, 166-199.

<sup>11</sup> See Harriet Friedmann/Philipp McMichael, *Agriculture and the state system: the rise and decline of national agriculture, 1870 to present*, in: *Sociologia Ruralis* 29 (1989), 93-117.

<sup>12</sup> See Corni/Gies, *Brot*, 371-392.

by disempowered his chief Richard W. Darré, the Minister of Food and Agriculture and Reich Peasant Leader, from 1936 onwards, the order of a ‘world economy’ (*Weltwirtschaft*) under British rule was to be replaced by the order of a European ‘greater area economy’ (*Großraumwirtschaft*) under German hegemony.<sup>13</sup> The project of economic reordering at the European level by the German Reich was interconnected with the project of political reordering through military aggression; both amalgamated into the political-economic ‘macro-project’<sup>14</sup> of the Nazi food regime. Though this vision (as every ‘macro-project’)<sup>15</sup> diverged from reality, it guided the thoughts and actions of decision makers, scientific experts and functionaries in the agrarian apparatus of the ‘Third Reich’.<sup>16</sup>

According to the ‘macro-project’ of the ‘greater area economy’, the German Reich aimed at reorienting its food commodity chains from the world market towards bilateral trade relations, especially with confederate states in Southeast Europe, on the one hand and domestic production on the other hand.<sup>17</sup> Thus, from 1934 onwards, the German agrarian leaders annually announced a state-led production campaign, labelled ‘battle for production’ (*Erzeugungsschlacht*).<sup>18</sup> Though I would not claim that the ‘battle for production’ was lost,<sup>19</sup> the harvest yielded was rather mixed, as is indicated by the degree of self-sufficiency at the eve of the Second World War (Table 1). Whereas the domestic supply of bread grain exceeded the demand and the production of potatoes, vegetables, sugar and meat lay at or slightly below the level of self-sufficiency, the domestic provision of eggs and leguminous plants was considerably worse. However, by far the worst result was achieved by the domestic production of animal and vegetable fats; the degree of self-sufficiency had only slightly improved from 52 percent in 1933/34 to 57 percent in

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<sup>13</sup> See Herbert Backe, *Um die Nahrungsfreiheit Europas. Weltwirtschaft oder Großraum*, Leipzig 1942.

<sup>14</sup> For a comparison of modernist ‘mega-projects’ or ‘macro-projects’ in different regimes see James C. Scott, *Seeing Like A State. How Certain Schemes to Improve the Human Condition Have Failed*, New Haven 1998.

<sup>15</sup> ‘Macro-projects’ by definition disconnect the present reality from the past and subordinate it to the vision of an alternative future. See Scott, *Seeing*.

<sup>16</sup> See Willi Oberkrome, *Ordnung und Autarkie. Die Geschichte der deutschen Landbauforschung, Agrarökonomie und ländlichen Sozialwissenschaft im Spiegel von Forschungsdienst und DFG (1920–1970)*, Stuttgart 2009, 90–232; Susanne Heim, *Kalorien, Kautschuk, Karrieren. Pflanzenzüchtung und landwirtschaftliche Forschung in Kaiser-Wilhelm-Instituten 1933–1945*, Göttingen 2003; Heinrich Becker, *Von der Nahrungssicherung zu Kolonialräumen: Die landwirtschaftlichen Institute im Dritten Reich*, in: idem et al. (eds.), *Die Universität Göttingen unter dem Nationalsozialismus*, Munich 1987, 410–436.

<sup>17</sup> See Corni/Gies, *Brot*, 371–392.

<sup>18</sup> See Clifford R. Lovin, *Die Erzeugungsschlacht 1934–1936*, in: *Zeitschrift für Agrargeschichte und Agrarsoziologie* 22 (1974), 209–220; Corni/Gies, *Brot*, 261–280.

<sup>19</sup> See Stephanie Degler/ Jochen Streb, *Die verlorene Erzeugungsschlacht: Die nationalsozialistische Landwirtschaft im Systemvergleich*, in: *Jahrbuch für Wirtschaftsgeschichte* (2008) H. 2, 161–181.

1938/39.<sup>20</sup> Accordingly, Herbert Backe, the executive of the food issues of the expansionist 1936 Four Years Plan, together with agrarian experts lamented the ‘fat gap’ (*Fettlücke*) of German food economy.<sup>21</sup> Since Hitler and many other Nazi leaders were in fear of food riots as experienced in the First World War,<sup>22</sup> the ‘fat gap’ was not only an economic, but also a supremely political issue.

**Table 1: National self-sufficiency in food products in Germany, 1933/34–1938/39 (percent)**

food product	1933/34	1938/39
bread grain	99	115
leguminous plants (without lentils)	50	71
potatoes	100	100
vegetables	90	91
sugar	99	101
meat	98	97
eggs	80	82
fats	53	57
total food production	80	83

Source: Volkmann, *NS-Wirtschaft*, 301.

In order to close the ‘fat gap’, the decision-makers of the Nazi food regime shifted levers at several links of the agro-food chain. On the consumption side, the fat content of the German population’s diet ought to be reduced by the ‘direction of consumption’ (*Verbrauchslenkung*) and, since the beginning of war, the development of synthetic surrogates.<sup>23</sup> In the domain of distribution, the agrarian apparatus sought to raise imports of fats from all over German-dominated Europe by bilateral trade treaties with federate countries and, after the beginning of war in 1939, exploitation of the agricultural resources of the dependent and occupied areas.<sup>24</sup> On the production side, the state-led campaign for domestic fat production was not only prolonged to the wartime period, but also enforced under the label of ‘war battle for production’ (*Kriegserzeugungsschlacht*).<sup>25</sup> Besides the domain of animal fats (which is not in the focus of this

<sup>20</sup> See Heinrich E. Volkmann, *Die NS-Wirtschaft in Vorbereitung des Krieges*, in: Militärgeschichtliches Forschungsamt (ed.), *Das Deutsche Reich und der Zweite Weltkrieg*, vol. 1: Ursachen und Voraussetzungen der deutschen Kriegspolitik, Stuttgart 1979, 177-368, here 301.

<sup>21</sup> See Corni/Gies, *Brot*, 309-318.

<sup>22</sup> See Martin Kutz, *Kriegserfahrung und Kriegsvorbereitung. Die agrarwirtschaftliche Vorbereitung des Zweiten Weltkrieges in Deutschland vor dem Hintergrund der Weltkrieg I-Erfahrung*, in: Zeitschrift für Agrargeschichte und Agrarsoziologie 32 (1984), 59-83, 135-164; Corni/Gies, *Brot*, 399-409.

<sup>23</sup> See Reinhold Reith, „Hurrah die Butter ist alle!“ „Fettlücke“ und „Eiweißlücke“ im Dritten Reich, in: Michael Pammer/Herta Neiß/Michael John (eds.), *Erfahrung der Moderne. Festschrift für Roman Sandgruber zum 60. Geburtstag*, Stuttgart 2007, 403-426.

<sup>24</sup> See Corni/Gies, *Brot*, 499-554.

<sup>25</sup> See Werner Abelshauser, *Germany: Guns, Butter, and Economic Miracles*, in: Mark Harrison (ed.), *The Economics of World War II. Six Great Powers in International Comparison*, Cambridge 1998, 122-176; Corni/Gies, *Brot*, 469-497.

article), the production of vegetable fats ought to be raised by expansion of the acreage devoted to oilseeds. While the Nazi food regime mostly set political impositions (e.g. the confiscation of all food surpluses on the farm since the beginning of war), in this case economic incentives prevailed. A comprehensive package comprising financial, technical and legal measures was tied in order to promote the expansion of oilseed-growing: high fixed prices; additional bonuses for delivery contracts with processing enterprises; extra rations of nitrogen fertilizer; guaranteed redelivery of protein-rich oilcake as feeding stuff; special extension services and so on.<sup>26</sup>

Figure 1: Leaflet promoting the cultivation of oilseeds in the province of Niederdonau, 1940

**Oelfruchtanbau – lohnt sich!**  
**Baut mehr Oelfrüchte – aber nur dort, wo sie hinpassen!**

**Höchster Fettertrag je Flächeneinheit**  
**1 ha Raps u. Rübsen**  
 ergibt durchschnittlich

**Körnerertrag**  
**18 Dz = 6,5 Dz**  
**Oelkuchen**  
**11 Dz = 1 Dz**  
**Gesamtertrag = 7,5 Dz**

**Reinfett**  
**Reinfett über Milch-  
 erzeugung**

**KASSE**  
 Gute Preise, gesicherte Abnahme, zusätzliche Prämien insgesamt 44 RM je dz

**Günstige Vorbedingungen für eine gute Weizenernte**  
 Durchschnittsmehrertrag an Weizen nach Raps beträgt: 10 vH

**In einem Jahr vom gleichen Feld zwei Ernten!**  
 Raps u. Rübsen Jan Feb März Apr. Mai Juni Juli  
 Zwischenfrüchte Kohlfacten Aug Sept Okt Nov Dez

Source: *Wochenblatt der Landesbauernschaft Donauland* 19/1940, enclosed leaflet.

How the ‘socio-technical network’<sup>27</sup> of oilseed-growing addressed the farm holders, is exemplified by a leaflet distributed in 1940 via the official farmers’ journal in the province of Niederdonau (Figure 1). The headline follows a purely economic line of argumentation: ‘Oilseed-growing is worthwhile! Grow more oilseeds – but solely at suitable locations!’ In the centre of the chart, a macro-economic perspective prevails, arguing that one hectare of rape yields 650

<sup>26</sup> See *Wochenblatt der Landesbauernschaft Donauland* 19/1940, enclosed leaflet. On wartime agricultural price policy see Arthur Hanau/ Roderich Plate, *Die landwirtschaftliche Markt- und Preispolitik im Zweiten Weltkrieg*, Stuttgart 1975.

<sup>27</sup> See Ploeg, *Virtual Farmer*, 101-141.

kilograms of fat directly and, via milk production by dairy cows fed with oilcake, 100 kilograms indirectly, therefore 750 kilograms in total. At the margins of the chart, micro-economic arguments appeal to the – male – farmer's self-interest: the redelivery of oilcake as feeding stuff in the upper left corner; the yield increase of wheat as subsequent crop in the lower left corner; high prices and bonuses in the upper right corner; and annual multi-cropping through cultivation of rape and intertillage on the same field in the lower right corner. The message encoded in this visual and textual arrangement of signs can be decoded as follows: growing more oilseeds serves not only the interest of the national food economy, but also the farmer's self-interest, i.e. higher profits through a more intensive use of land and livestock as well as better rewards.<sup>28</sup>

Strikingly, the discourse of oilseed-growing as mediated by the agrarian press was not in line with the Nazi agrarian ideology; moreover, it considerably diverged from it. The Nazi 'blood and soil'-ideology idealised the figure of the 'peasant', driven by extra-economic motives such as the provision of a 'racially' pure community both at the levels of the family and the German 'people'; furthermore, it condemned the figure of the profit-oriented 'farmer'.<sup>29</sup> However, the discourse of the state-led production campaign as mediated by this leaflet turns the ideological hierarchy of 'peasant' and 'farmer' upside down: it praises the male 'rational farmer' who decides to grow oilseeds due to precise calculation of costs and benefits. Nazi agrarianism, conventionally taken as an evidence for the 'anti-modern' character of Nazism, was in practice more flexible and, thus, more compatible with modernist notions of farming than claimed so far. The discourses of the 'battle for production' in general and oilseed-growing in particular appealed to farm holders to subject themselves to the subject-position of the 'productivist farmer'.

To what extent did farm holders in Niederdonau respond to the state-led production campaign for oilseed-growing? Since rape and turnip rape accounted for nearly one half of the acreage devoted to oilseeds (Table 2), we focus on these two crops. According to the official agricultural statistics, there was no considerable response until 1940; however, from 1941 to 1944, the percentage of arable land devoted to rape and turnip rape increased substantially. At the province level, the proportions amounted to 0.5 (1941), 0.4 (1942), 0.8 (1943) and 0.6 percent (1944) of the arable land. An investigation at the district level reveals a broad distribution (Figure 2). For example, in the district of Gmünd in the north-west of the province, only marginal areas were devoted to these crops; in the district of Gänserndorf in the east, their proportion peaked in

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<sup>28</sup> See *Wochenblatt der Landesbauernschaft Donauland* 19/1940, enclosed leaflet.

<sup>29</sup> See Mathias Eidenbenz, „Blut und Boden“. *Zu Funktion und Genese der Metaphern des Agrarismus und Biologismus in der nationalsozialistischen Bauernpropaganda* R. W. Darrés, Bern u.a. 1993; Anna Bramwell, *Blood and Soil. Walther Darré and Hitler's Green Party*, Abbotsbrook 1985; Clifford R. Lovin, *Blut und Boden: The Ideological Basis of Nazi Agricultural Program*, in: *Journal of the History of Ideas* 28 (1967), 279-288.

1941 and declined afterwards; in the district of Melk in the southwest, the cultivation of rape and turnip rape increased continuously. To sum up, on the field of oilseed-growing the ‘battle for production’ in Niederdonau turned out victoriously (though in other branches defeats were to be accepted); the acreage devoted to rape and turnip rape grew more than hundredfold from 43 hectares in 1937 to 4.453 hectares in 1944.<sup>30</sup>

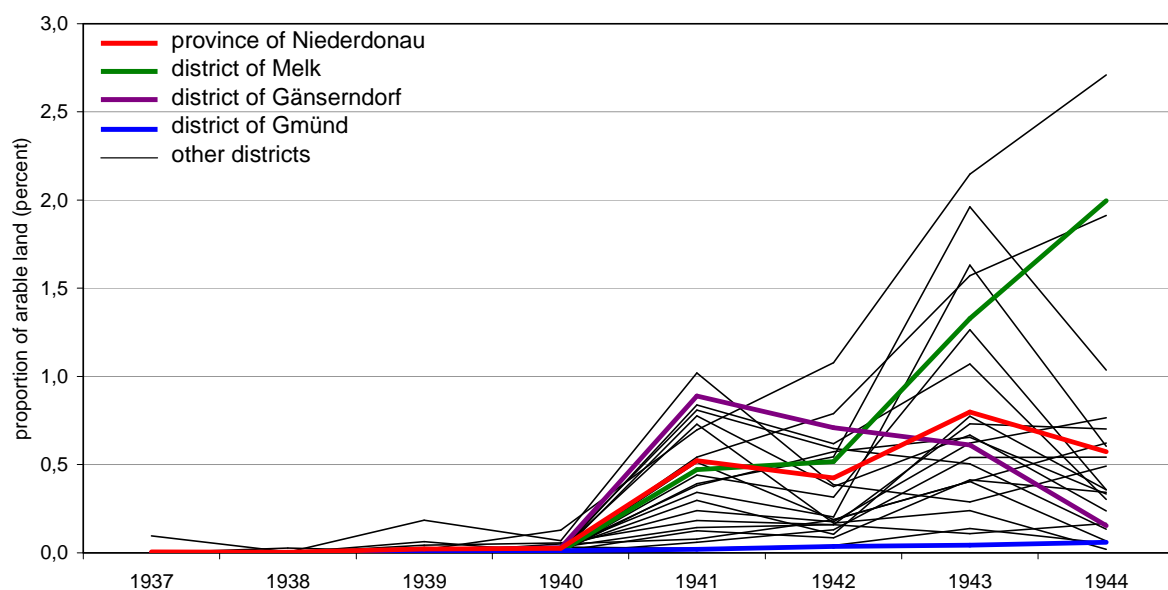
**Table 2: Cultivation of oilseed crops in Niederdonau, 1943**

crop	area (ha)	proportion (percent)
rape	6211	43,7
poppy	3048	21,4
flax	1698	11,9
hemp	1045	7,4
turnip rape	485	3,4
others	1727	12,1
total	14214	100,0

Note: The South-Moravian districts of Neubistritz, Nikolsburg and Znaim are not included.

Source: own calculations based on Österreichisches Statistisches Zentralamt (ed.), *Ergebnisse*.

**Figure 2: Proportion of arable land devoted to rape and turnip rape in Niederdonau, 1937–1944**



Note: The South-Moravian districts of Neubistritz, Nikolsburg and Znaim are not included.

Source: own calculations based on Österreichisches Statistisches Zentralamt (ed.), *Ergebnisse*.

From a macro-level perspective, our investigation would come to an end at this point. As an answer to the question about the success or failure of the state-led food production campaign in the ‘Third Reich’, our aggregate data reveal a considerable response by the farming community on the field of oilseed-growing. However, this answer raises another question: who were the farm

<sup>30</sup> Own calculations based on Österreichisches Statistisches Zentralamt (ed.), *Ergebnisse der landwirtschaftlichen Statistik in den Jahren 1937-1944*, Vienna 1948.

holders subjecting themselves to the subject-position of the ‘productivist farmer’? More precisely, under which conditions, by which strategies and with which consequences did they link their ‘micro-projects’ – i.e. farming styles as ‘modes of ordering’ of agrosystems – to the ‘macro-project’ of the Nazi food regime? Therefore, we have to shift our attention to the micro-level in order to ‘follow the actors’<sup>31</sup> on their pathways in the ‘battlefield’ of wartime farming.

### III. Agrosystems and farming styles as ‘micro-projects’

The province of Niederdonau comprised a huge variety of farming systems,<sup>32</sup> as is indicated by the local patterns of land use in 1938 (Figure 3). In order to grasp this agrosystemic spectrum and with regard to the availability of farm-level data, three regions in the districts of Gänserndorf, Gmünd and Melk have been selected; as shown above, these districts represent different patterns of response to the campaign for oilseed-growing: the region of Matzen in the district of Gänserndorf was characterised by mixed viticulture and arable farming with an emphasis on grain at favourable natural and infrastructural locations in the eastern flat and hilly land; in the region of Litschau in the district of Gmünd, arable farming with an emphasis on root crops and forestry at less favourable locations in the north-western highlands prevailed; the region of Mank in the district of Melk in the south-western part was divided into an area shaped by arable farming under favourable conditions and an area shaped by grassland farming at more mountainous and remote locations. For 17 communes in these regions, the farm and household data (land use, arable crops, labour force, machinery, livestock etc.) of in total 1552 farming units recorded in the official ‘farm file’ (*Hofkarte*) 1941 to 1944 have been captured.<sup>33</sup> As a comparison with the 1939 agricultural census reveals, this dataset is far from being complete (Table 3). Whereas in the Mank region, nearly all farming units registered by the census are documented by ‘farm files’, one eighth in the Litschau region and even one third in the Matzen region are missing. The most serious discrepancy concerns farming units below five hectares in the Matzen region; here, a considerable number of the lists of smallholdings, which were registered separately, have been

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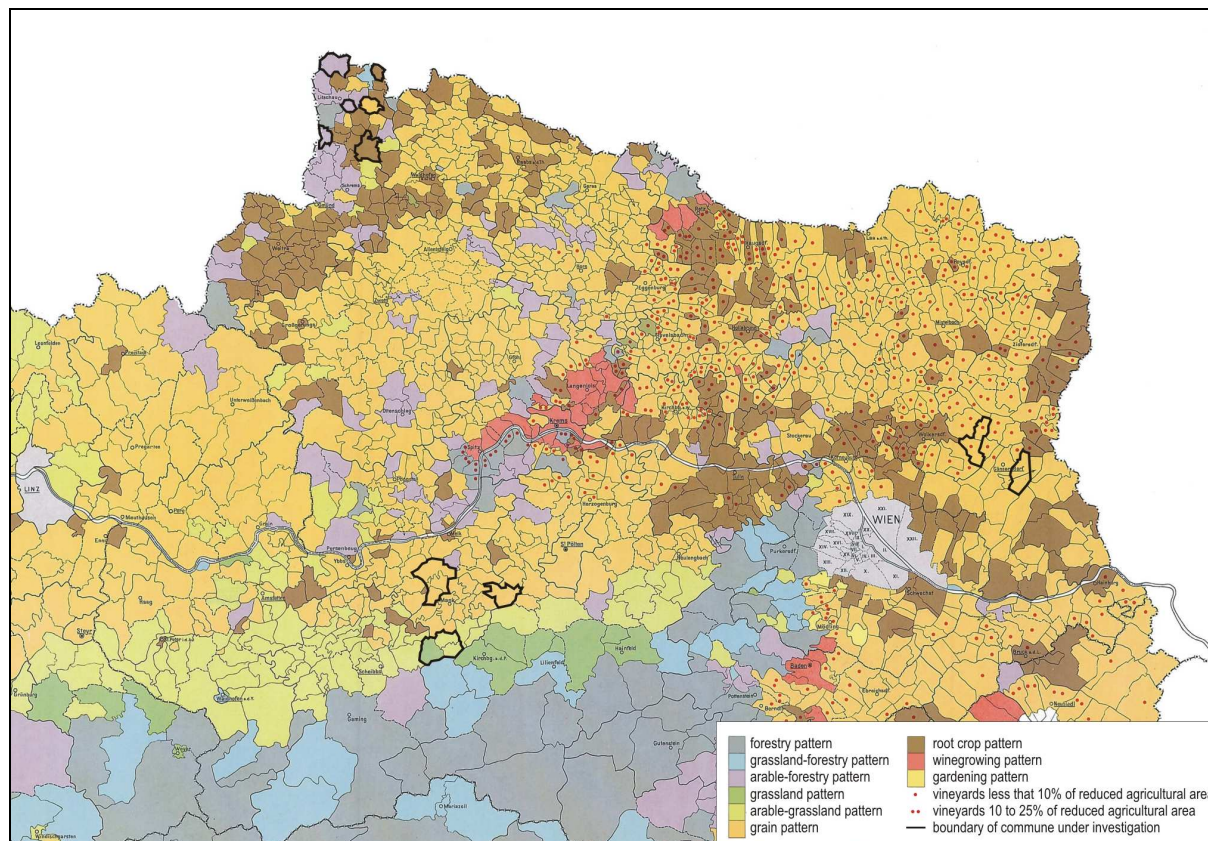
<sup>31</sup> For this ‘credo’ of actor-network theory see Bruno Latour, *Reassembling the Social. An Introduction to Actor-Network-Theory*, Oxford 2005, 11 f.

<sup>32</sup> For a detailed description of the agricultural ‘production zones’ in Niederdonau see Landesbauernschaft Donauland (ed.), *Die landwirtschaftlichen Produktionsgebiete in der Landesbauernschaft Donauland*, Vienna 1940; idem (ed.), *Das Gefüge der landwirtschaftlichen Produktionsgebiete im Donauland*, Vienna 1941.

<sup>33</sup> The originals of the ‘farm files’ fed into the project’s database are available at the Provincial Archives of Lower Austria (*Niederösterreichisches Landesarchiv*, NÖLA) in St. Pölten.

lost before archival storage. Indeed, these discrepancies have to be taken into account in the course of the interpretation.

**Figure 3: Local patterns of land use in Lower Austria, 1938**



Note: land use data were collected in 1938; the boundaries represent the administrative units in 1951.

Source: own design based on Anton Steden, *Formen der Bodennutzung in Niederösterreich*, in: Erik Arnberger (ed.), *Atlas von Niederösterreich (und Wien)*, Vienna 1952, map 90.

**Table 3: Number of farming units according to the 1939 agricultural census and the 1941 ‘farm file’**

region	source	units classified according to the cultivated area				total units
		< 5 ha	5-9.9 ha	10-19.9 ha	20-99.9 ha	
Mank (8 communes)	census	243	124	157	115	639
	‘farm file’	238	114	157	110	619
	difference	-5	-10	0	-5	-20
Matzen (3 communes)	census	537	85	62	35	719
	‘farm file’	312	79	57	35	483
	difference	-225	-6	-5	0	-236
Litschau (6 communes)	census	290	99	75	49	513
	‘farm file’	265	84	54	47	450
	difference	-25	-15	-21	-2	-63
total (17 communes)	census	1070	308	294	199	1871
	‘farm file’	815	277	268	192	1552
	difference	-255	-31	-26	-7	-319

Source: own calculation based on NÖLA, BBK Mank, Matzen and Litschau, Hofkarten 1941-1944; Statistisches Reichsamt (ed.), *Ergebnisse der Volks-, Berufs- und landwirtschaftlichen Betriebszählung 1939 in den Gemeinden* (Statistik des Deutschen Reichs 559/13: Alpen- und Donau-Reichsgaue), unpublished manuscript [Berlin 1944].

The dataset comprising 1552 cases with eleven features each<sup>34</sup> has been interpreted by aid of two multi-variate statistical techniques of Geometric Data Analysis: *Multiple Correspondence Analysis* (MCA) and *Hierarchical Cluster Analysis* (HCA).<sup>35</sup> MCA arranges the cases according to the (dis-)similarities of their features within a multi-dimensional space: cases and features lying in close vicinity are relatively similar to each other; vice versa, a great distance between two elements indicates relative difference. The first, second and following dimensions of this space indicate differentiating moments of the totality of farming units with decreasing importance. HCA helps to identify groups of cases with similar features – agrosystems and their corresponding farming styles – within the multi-dimensional space. Since every farming unit is positioned within the multi-dimensional space and the respective cluster, this methodical toolbox enables to interlink structural analyses of the totality and sub-groups of cases with single in-depth case studies. Thus, the conventional divide between ‘quantitative’ and ‘qualitative’ methods gets blurred; divergent methods converge towards one flexible *methodology*.

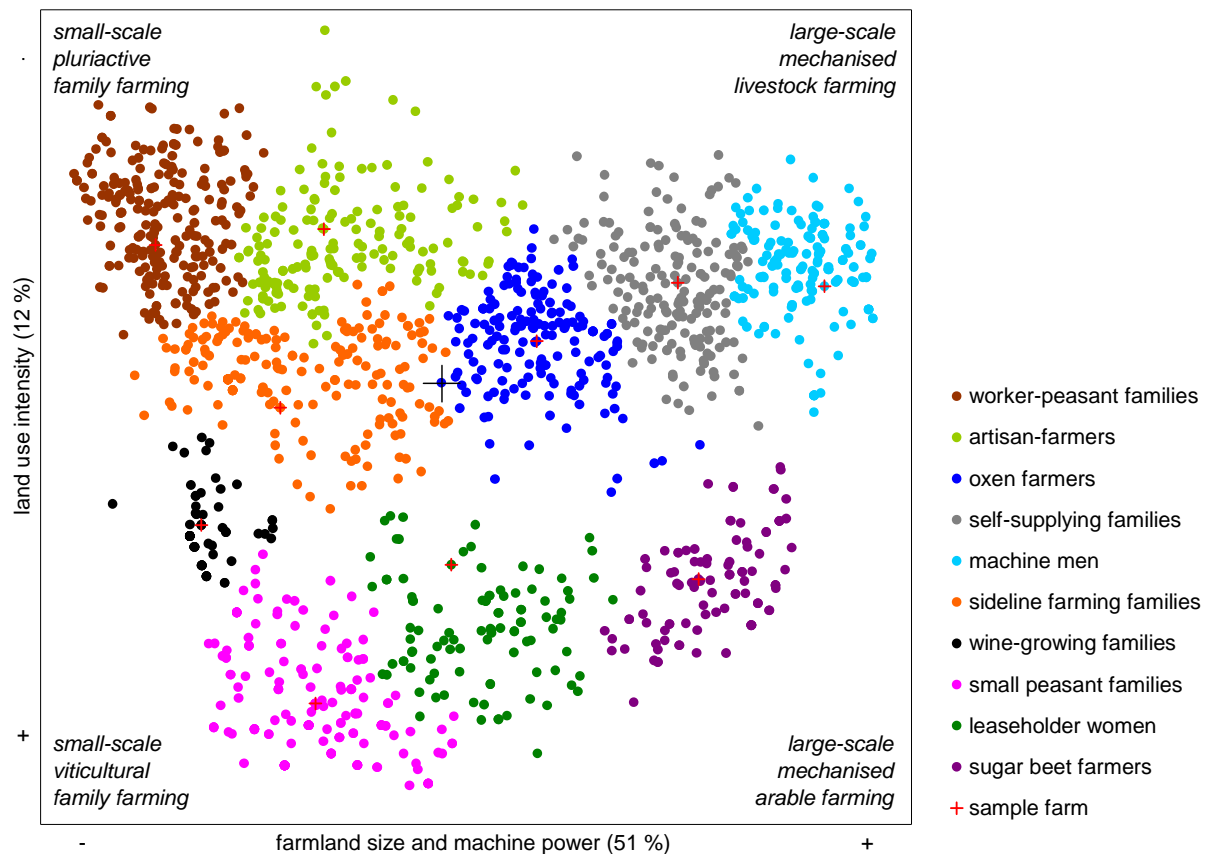
The MCA of our dataset reveals that the first and second dimensions of the multi-dimensional space explain 51 and 12 percent, together 63 percent, of the modified variance of the scatter plot. For this reason, I confine my analysis to these two most explicatory dimensions, even if investigating further dimensions would broaden and deepen my findings (Figure 4). The first and most important dimension, depicted by the horizontal axis of the scatter plot, arranges the farming units basically according to *farmland size* and the *principal source of power*: whereas on the left pole of the gradient the amount of *human labour* assigned to one unit of farmland is highest, on the right pole the amount of *mechanical capital* reaches its maximum. In short, the first dimensions is characterised by the gradient of high labour intensity on small-scale farms versus high capital intensity in large-scale farms, therefore indicating economies of scale through mechanisation. Since in the 1940s only some steps of the manual working process could be replaced by machines, the strongly mechanised medium-sized and large farms depended on considerable amounts of human labour, too. Thus, the first dimension also involves a tension between family labour, sometimes combined with sideline occupations, on the left and (permanent and occasional) non-family labour on the right.

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<sup>34</sup> These features comprise: commune, sideline occupation of the owner, Steden’s type of land use, farmland size, percentages of family, permanent non-family and occasional non-family labourers, Chayanov’s labour-consumer balance, labour, livestock and machinery intensity.

<sup>35</sup> See Brigitte Le Roux / Henry Rouhanet, *Geometric Data Analysis. From Correspondence Analysis to Structured Data Analysis*, Dordrecht 2004.

Figure 4: The agrosystemic space of farming in the regions of Mank, Matzen and Litschau, 1941



Source: own calculation (MCA and HCA of 1552 farming units) based on NÖLA, BBK Mank, Matzen and Litschau, Hofkarten 1941-1944.

The second dimension, depicted by the vertical axis of the scatter plot, arranges the farming units basically according to the *intensity of land use*. On the lower pole of the gradient, the viticultural and, thus, most intensive forms of land use – the winegrowing, root crop-winegrowing and grain-winegrowing types – prevail; on the upper pole, more extensive forms of land use – the forage crop, grain and root crop types – come to the fore.<sup>36</sup> Accordingly, the scatter plot also reveals a tension between Auersthal and Raggendorf, the winegrowing communes in the Matzen region, and the arable farming communes in the Mank (e.g. Bischofstetten) and Litschau regions (e.g. Heidenreichstein). Since in the 1940s arable and livestock farming were deeply integrated, land use intensity was negatively correlated with livestock intensity. The second dimension also indicates a demographic aspect: the ratio of ‘consumers’, i.e. family members not yet or no longer able to do agricultural work (children, elderly, invalids etc.), to ‘workers’ (*c/w ratio*) within the farm holder’s family,<sup>37</sup> was below average on the lower pole and above average on the upper pole.

<sup>36</sup> These types of land use have been defined by the agronomist Anton Steden for the purpose of bookkeeping statistics. See Landwirtschaftliche Buchführungs-Gesellschaft (ed.), *Die Lage der Landwirtschaft des Bundeslandes Niederösterreich im Vergleichsjahr 1937*, Vienna 1948.

<sup>37</sup> See Frank Ellis, *Peasant Economics. Farm Households in Agrarian Development*, Cambridge 1993, 109-117.

Thus, farming was driven by the need to feed incapacitated family members to a larger extent in the Mank and Litschau regions than in the Matzen region.

Through combination of both dimensions, a two-dimensional space emerges, arranging farming units in the regions of Mank, Matzen and Litschau in 1941 according to farmland size and mechanisation on the horizontal axis and land use intensity on the vertical axis. The corners of this space are directed towards ideal types of farming, beyond the reality gathered by our dataset. The upper left corner points towards *small-scale pluriactive family farming*, the upper right corner indicates *large-scale mechanised livestock farming*, the lower right corner is oriented towards *large-scale mechanised arable farming*, finally, in the lower left corner we can find *small-scale viticultural family farming*. The real types of farming in between these ideal types can be identified by aid of HCA according to the distances between the cases. Thereby, the 1552 farming units are grouped by ten clusters which indicate particular ‘socio-technical networks’, i.e. farming styles as ordering principles of agrosystems. I have labelled these relatively homogeneous clusters of farming units according to their most outstanding features compared to the totality (Table 4): *worker-peasant families*, *artisan-farmers*, *oxen farmers*, *self-supplying farms*, *machine men*, *sideline farming families*, *winegrowing families*, *small peasant families*, *leaseholder women* and *sugar beet farmers*.<sup>38</sup>

**Table 4: Features of agrosystems and farming styles in the regions of Mank, Matzen and Litschau, 1941**

values of features	percentage of total cases (N=1552)	sugar beet farmers (N=99)	machine men (N=160)	self-supplying families (N=182)	oxen farmers (N=171)	artisan-farmers (N=170)	worker-peasant families (N=237)	sideline farming families (N=196)	winegrowing families (N=67)	small peasant families (N=164)	leaseholder women (N=106)
type of land use											
<b>forage farm</b>	20,9	-	+	++	++	+	-	o	-	-	-
<b>grain-winegrowing farm</b>	19,1	++	-	-	-	-	-	-	-	++	++
<b>grain farm</b>	13,3	-	++	+	o	o	-	-	-	-	-
(grassland-forestry farm)	1,1	-	o	++	o	+	-	++	-	-	-
<b>root crop-winegrowing farm</b>	4,4	-	-	-	-	-	-	-	++	++	o
<b>root crop farm</b>	36,4	-	-	o	o	+	++	++	-	-	-
<b>winegrowing farm</b>	4,3	-	-	-	-	-	-	-	++	o	o
cultivated area											
<b>&lt; 1 ha</b>	9,8	-	-	-	-	o	++	o	++	-	-
<b>1-1.9 ha</b>	13,7	-	-	-	-	+	++	o	++	o	-
<b>2-4.9 ha</b>	29,1	-	--	-	-	+	o	+	-	++	+
(5-9.9 ha)	17,8	+	-	+	++	-	--	+	--	--	++
<b>10-19.9 ha</b>	17,3	++	+	++	+	-	-	-	-	-	-
<b>20-49.9 ha</b>	11,9	+	++	+	o	-	-	-	-	-	-
(50-99.9 ha)	0,5	++	+	+	o	-	-	-	-	-	-

<sup>38</sup> This labelling is inspired by the Dutch farming styles outlined in Ploeg, *Virtual Farmer*, 101-109.

location/region												
<b>Auersthal/Matzen</b>	15,4	++	-	-	-	-	-	-	-	++	++	
<b>Bischofstetten/Mank</b>	7,2	-	++	+	o	+	o	-	-	-	-	
(Finsternau/Litschau)	3,0	-	-	o	o	++	++	++	-	-	-	
(Grimmege/Mank)	3,2	-	++	+	o	o	-	o	-	-	-	
(Großradischen/Litschau)	3,7	-	o	++	+	o	++	o	-	-	-	
(Haugschlag/Litschau)	5,0	-	o	o	+	o	++	+	-	-	-	
<b>Heidenreichstein/Litschau</b>	8,3	-	-	+	+	++	++	o	-	-	-	
(Hirschenschlag/Litschau)	2,7	--	-	++	+	o	++	++	--	--	--	
(Kleinpertholz/Litschau)	1,0	-	-	-	-	+	++	+	-	-	-	
(Loimanns/Litschau)	4,3	-	-	-	+	o	+	++	o	-	-	
(Plankenstein/Mank)	6,3	-	o	++	++	o	-	+	-	-	-	
(Pöllendorf/Mank)	4,8	-	++	+	+	+	o	o	-	-	-	
<b>Raggendorf/Matzen</b>	11,7	+	-	-	-	-	-	-	++	o	+	
<b>Ritzengrub/Mank</b>	8,4	-	++	++	+	+	o	-	-	-	-	
(St. Gotthard/Mank)	2,8	-	o	+	+	o	-	++	-	-	-	
(St. Leonhard am Forst/Mank)	1,9	-	o	o	+	++	+	-	-	-	-	
(Texing/Mank)	5,3	-	-	+	++	o	o	++	-	-	-	
(Weikendorf/Matzen)	4,1	++	o	o	-	-	-	++	o	-	-	
(Wielandsberg/Litschau)	1,0	-	-	-	-	+	++	-	-	-	-	
farm and household members												
<b>family share below average</b>	29,8	++	++	+	-	o	-	-	-	-	o	
family share on average	8,8	++	-	++	++	-	--	--	--	-	+	
<b>family share above average</b>	61,5	--	--	--	o	o	++	+	++	+	o	
servants' share below average	72,2	--	--	-	+	o	+	+	+	+	o	
(servants' share on average)	0,6	+	++	-	o	-	-	-	-	-	-	
<b>servants' share above average</b>	27,1	++	++	+	-	o	-	-	-	-	o	
<b>day-labourers' share below average</b>	56,6	--	--	-	-	+	++	++	++	+	o	
day-labourers' share on average	20,2	-	+	++	++	+	--	--	-	-	o	
<b>day-labourers' share above average</b>	23,2	++	++	+	o	-	-	-	-	-	o	
c/w ratio below average	48,8	+	o	-	o	--	-	+	++	++	o	
(c/w ratio on average)	26,4	+	+	-	+	o	o	-	--	--	++	
<b>c/w ratio balance above average</b>	23,4	-	o	++	o	++	+	-	-	--	-	
factor intensities												
<b>labour extensive</b>	49,9	++	++	++	+	o	--	-	--	--	o	
labour intensity on average	28,1	--	--	-	-	+	o	++	-	++	+	
<b>labour intensive</b>	22,0	-	-	-	-	o	++	o	++	o	-	
<b>livestock extensive</b>	33,3	++	--	-	-	--	-	o	++	+	+	
livestock intensity on average	35,6	o	++	o	++	-	--	o	--	o	+	
<b>livestock intensive</b>	31,1	--	o	+	o	++	++	-	-	-	-	
<b>capital extensive</b>	55,9	--	--	--	-	++	++	+	++	+	o	
<b>capital intensity on average</b>	27,5	o	++	++	++	-	--	-	--	o	o	
<b>capital intensive</b>	16,6	++	+	+	o	-	-	-	-	-	+	
farm holder's main occupation (selection)												
agriculture	53,9	++	++	+	o	-	--	-	+	--	+	
<b>occupation not registered</b>	17,1	-	-	o	+	-	-	o	-	++	o	
unskilled worker	3,8	-	-	-	o	++	++	-	-	-	-	
bricklayer	3,2	-	-	-	-	o	++	o	o	-	-	
(retiree etc.)	2,1	-	-	-	-	+	++	+	-	-	-	
(carpenter)	2,0	-	-	-	-	++	++	o	-	-	-	
(innkeeper)	1,4	-	+	++	+	++	o	-	-	-	-	
(farm labourer)	1,4	-	-	-	-	+	++	++	-	-	-	
(forest labourer)	1,2	-	-	-	-	++	++	+	-	-	-	
(factory worker)	1,0	-	-	-	-	-	++	-	-	-	-	
(smith)	0,6	-	-	-	++	++	++	+	-	-	-	
(merchant)	0,4	-	-	-	-	++	+	-	-	-	-	
(miller)	0,3	-	-	++	-	++	-	+	-	-	-	
(butcher)	0,2	-	-	-	-	++	-	-	-	-	-	

particular features(selection)											
<i>female farm management</i>	14,7	+	--	o	-	-	o	-	o	o	++
<i>leasehold of parcels</i>	77,8	++	-	-	-	-	-	-	+	+	++
<i>more than 75 % of acreage devoted to potatoes</i>	2,3	-	-	-	-	+	++	o	o	-	-
<i>sugar beets</i>	6,4	++	+	o	-	-	-	-	-	-	o
<i>trade crops (including oilseeds)</i>	83,6	++	++	+	o	o	-	-	-	-	-
<i>two horses</i>	13,0	++	++	+	o	-	-	-	-	-	o
<i>one or more bulls</i>	5,1	o	++	+	o	-	-	-	-	-	-
<i>two or more oxen</i>	16,8	-	+	++	++	-	-	-	-	-	-
<i>ten or more cows</i>	3,8	o	++	o	-	-	-	-	-	-	-
<i>forage silo</i>	7,4	++	+	o	-	-	-	-	-	-	o
<i>tractor</i>	3,7	++	++	o	-	-	-	-	-	-	-
<i>electric motor</i>	14,9	++	+	o	-	-	-	-	-	o	+
<i>combustion engine</i>	12,3	o	++	++	+	-	-	-	-	-	-
<i>threshing machine</i>	28,9	++	+	+	+	-	--	-	--	o	+
<i>manure distributor</i>	5,8	+	++	++	o	-	-	-	-	-	-
<i>reaper-binder drawn by horses</i>	3,5	++	o	o	-	-	-	-	-	-	-
<i>milking machine</i>	0,5	+	++	-	o	-	-	-	-	-	-
<i>washing machine</i>	1,5	++	++	o	-	-	-	-	-	-	o

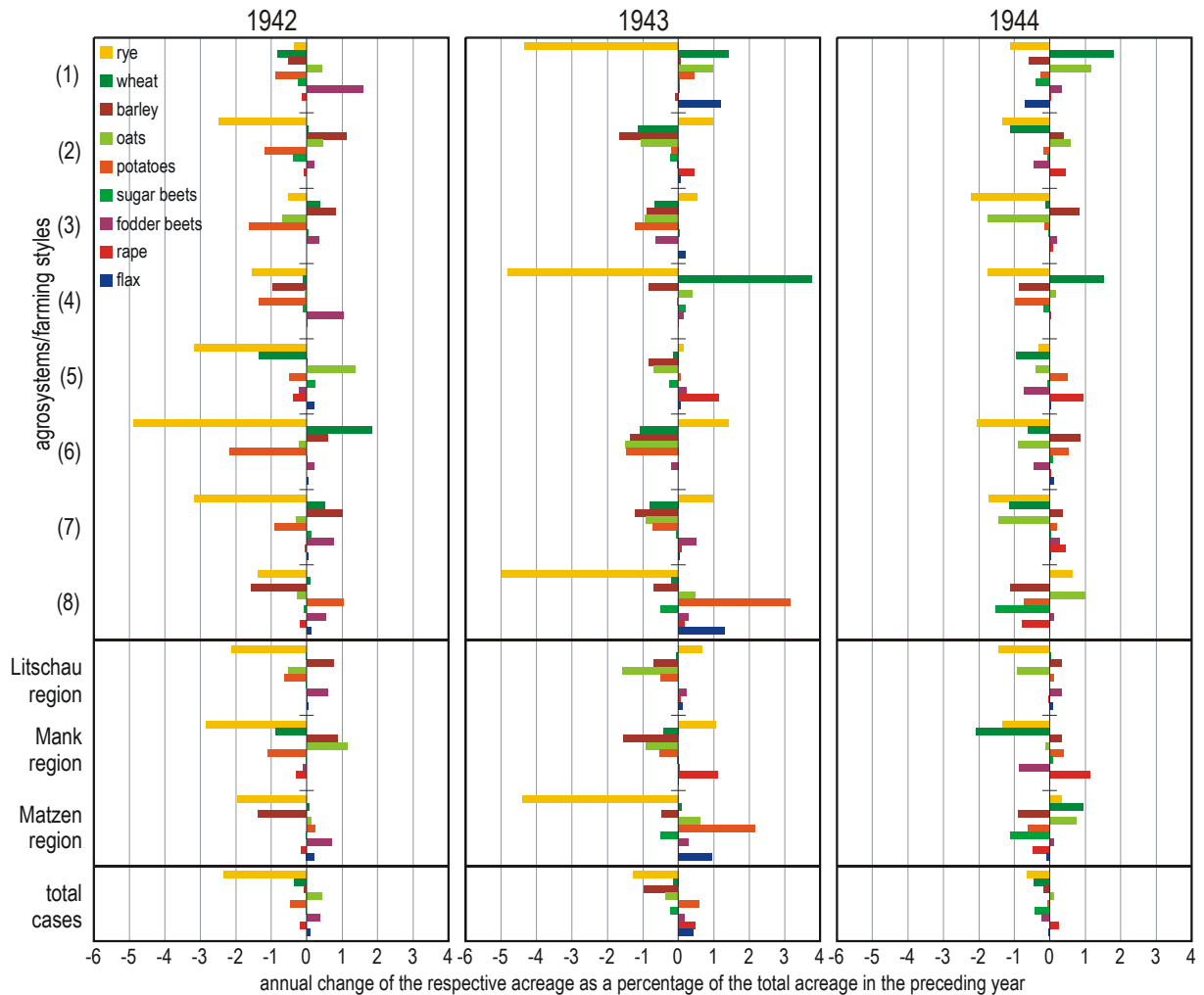
Legend: (value) = contribution to axis (> relative weight) and contribution to total space below average, value = contribution to axis (> relative weight) or contribution to total space above average, **value** = contribution to axis (> relative weight) and contribution to total space above average, value, *value* = passive feature (not actively included in MCA), -- = proportion strongly below average, - = proportion below average, o = proportion on average, + = proportion above average, ++ = proportion strongly above average.

Source: own calculation (MCA and HCA of 1552 farming units) based on NÖLA, BBK Mank, Matzen and Litschau, Hofkarten 1941-1944.

Before going into detail with these clusters of farming units, let us explore the farm holders' response to the state-led production campaign for oilseed-growing. Since the source this analysis is based upon only covers the years 1941 to 1944, land use data at the farm level are not available before this period. However, as is shown by the aggregate data for the districts of Niederdonau, the acreage devoted to oilseeds did not considerably increase until 1940. Therefore, our dataset covers the whole 'take off' phase of wartime oilseed-growing. Due to lack of data on arable land use for smallholdings in the 'farm file' (which were registered in separate lists), we have to exclude winegrowing and worker-peasant families; thus, the totality of cases included in our calculation decreases to 936. According to the annual farm holders' decisions about the acreage devoted to particular crops (Figure 5), two regions stand out with regard to oilseed-growing: in the Matzen region, the cultivation of flax boomed in 1943; in the Mank region, rape-growing shifted twofold in 1943 and 1944. In contrast, in the Litschau region as part of the traditionally most important production area of oilseed cultivation (particularly flax-growing for proto-industrial home-weaving) in Lower Austria,<sup>39</sup> no considerable changes occurred during the wartime years. Accordingly, the farm holders' response to the official campaign for oilseed-growing was highly selective in temporal and spatial terms. Only in the years 1943 and 1944 (and probably 1941) as well as in regions favourable to arable farming, this effort bore fruit.

<sup>39</sup> See Markus Cerman, *Proto-industrielle Entwicklung in Österreich*, in: idem / Sheila Ogilvie (eds.), *Protoindustrialisierung in Europa*, Vienna 1994, 161-175.

Figure 5: Arable land use decisions in the regions of Mank, Matzen and Litschau, 1941–1944



Legend: (1) leaseholder women, (2) self-supplying families, (3) artisan-farmers, (4) small peasant families, (5) machine men, (6) sideline farming families, (7) oxen farmers, (8) sugar beet farmers.  
Source: own calculation (936 farming units) based on NÖLA, BBK Mank, Matzen and Litschau, Hofkarten 1941-1944.

As the comparison of arable land use decisions by agrosystems shows, the farm holders' selective response to the oilseed-campaign was highly *style-specific*. Aside from the leaseholder women, who expanded the area devoted to flax in 1943 but reduced it in the following year, only two farming styles were amenable for the oilseed-campaign: the *sugar beet farmers* with regard to flax in 1943 and the *machine men* with regard to rape in 1943 and 1944. Within the agrosystemic space of farming, both clusters are located nearby at the right margin: the sugar beet farmers in the lower-right quadrant, the machine men in the upper-right quadrant. Both agrosystems were characterised by full-time farming, locations with favourable natural and infrastructural conditions, medium-sized to large farms, a land use emphasis on grain and cash crops such as sugar beets and oilseeds, high proportions of permanent and occasional non-family labourers,

low labour and high capital intensity. In short, the oilseed-growers turn out to be the vanguard of *(capital-)intensification, concentration and specialisation* in Niederdonau in the early 1940s.

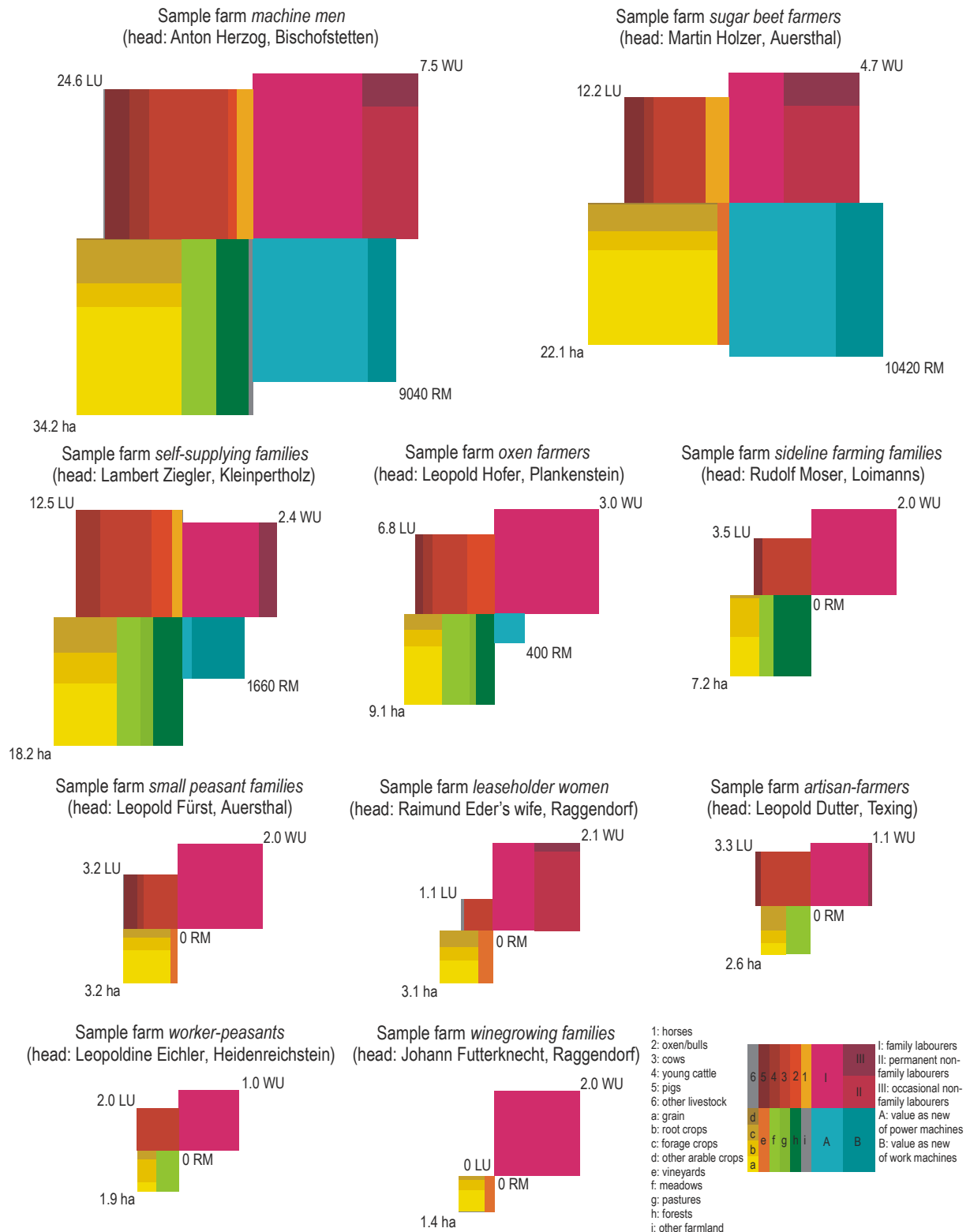
The outstanding agrosystemic profile of the oilseed-growers can be further elaborated by comparison of sample farms for each of the ten farming styles (Figure 4). For this comparative purpose, I have developed a diagram for visualising agrosystems, labelled *agrogram*, which is applicable at different (farm, local, regional etc.) levels of observation. It comprises four squares, each representing one category of agricultural resources – land (in hectares), livestock (in livestock units), labour force (in worker units) and machinery (in monetary value) – and its sub-categories (Figure 6). Already at first glance, the difference between the representatives of *sugar beet farmers* and *machine men* on the one hand and the rest of the sample farms on the other hand become clear: the large-scale resource base in absolute terms and the high intensity of machine capital (with regard to land, livestock and labour force) in relative terms.

The sample farm of the *sugar beet farmers* was a grain-winegrowing farm of 22.1 hectares, managed by Martin Holzer and his wife in Auersthal in the Matzen region. 1.8 hectares of land were leased; the rest of the farmland was owned by the couple. The arable land amounting to 20.3 hectares was divided into two thirds of grain – mainly rye, additionally wheat, barley, oats and corn – and one third of root crops – besides potatoes and fodder beets above all sugar beets –, forage crops and oilseeds. The Holzer farm was typical for the shift from rape- (1941: 0.3 hectares, 1942: 0.7 hectares) to flax-growing (1943: 0.6 hectares, 1944: 1.0 hectares) in the Matzen region. In addition, 1.7 hectares of vineyards were cultivated. The Holzer couple employed one male and one female servant as well as seven day-labourers for 200 days per year; this amounted to 4.7 work units. The livestock, 12.2 livestock units in total, comprised two horses, eight cattle, among them six dairy cows, eleven pigs and 18 chickens. Whereas the farm's labour (0.21 work units per hectare of agricultural land) and livestock intensity (0.55 livestock units per hectare of agricultural land) was below average, the intensity of machine capital (471 Reichsmark per hectare of agricultural land) was above average: the machinery including, among others, a tractor, an electric motor and a reaper-binder represented a value as new of 10420 Reichsmark. Besides the owner couple, five additional family members – three children and two retired adults – were to be fed; thus, the c/w ratio amounted to surpassing 3.05 (i.e. 3.05 consumers per labourer). However, taking a sideline occupation was not necessary; the considerable sales of wheat, rye, barley, oats, milk, meat and wine obviously carried enough income for the Holzer family.<sup>40</sup>

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<sup>40</sup> For the data see NÖLA, BBK Gänserndorf, Hofkarten Auersthal, Hofkarte no. 56.

**Figure 6: Agrograms of sample farms in the regions of Mank, Matzen and Litschau, 1941**



Legend: LU = livestock in livestock units (1 LU = 500 kilos live weight), WU = labour force in worker units (1 WU = 300 working days per year), RM = value as new of machinery in Reichsmark

Source: own calculation and design based on NÖLA, BBK Mank, Matzen and Litschau, Hofkarten 1941-1944.

The *machine men* are represented by Anton Herzog's grain farm in Bischofstetten in the Mank region. The cultivated land encompassed 34.2 hectares, being distributed to 20.3 hectares of arable land, 0.9 hectares of fruit gardens, 6.7 hectares of meadows and 6.2 hectares of forests.

Two thirds of the acreage were devoted to grain – mainly wheat, but also oats, barley and rye; one third was occupied mainly by forage crops – above all clover and lucerne – in addition to potatoes and fodder beets. As an exception to the rule, neither sugar beets, nor oilseeds were cultivated on the Herzog farm in 1941; however, in 1942 some rape (0.1 hectares) and in 1944 rape (0.9 hectares) and sugar beets (0.2 hectares) were grown. In addition to the farmer, four female family members – among them possibly the farmer’s wife – worked on the farm; furthermore, two male servants and eight day-labourers for 150 days per year were employed. With 7.5 work units in total or 0.27 work units per hectare of agricultural land, the labour intensity was below average. The livestock intensity (0.88 livestock units per hectare of agricultural land) was on average: two horses, 21 cattle, among them one bull and twelve dairy cows, 21 pigs and 50 pieces of poultry amounted to 24.6 livestock units. However, the farm’s capital intensity (323 Reichsmark per hectare of agricultural land) was above average: the machinery, including a tractor, an electric engine, a sowing machine, a threshing machine and many other equipment, represented a value as new of 9040 Reichsmark. Since there were no children or retirees to be fed, the c/w ratio amounted to the minimum of 1.0. Off-farm income was not necessary; according to the rudimentary records, the income gained by arable and livestock farming met the family’s needs.<sup>41</sup>

As these cases reveal, both the *sugar beet farmers* and the *machine men* were (re-)knotting ‘socio-technical networks’ in which the cultivation of oilseeds contributed to the style-specific coherence. It would be a shortcoming to assess these actor-networks solely from the *social* system; they also included elements of the *natural* system, as can be elaborated for rape, by far the predominant crop of wartime oilseed-growing in Niederdonau. The rape plant (*Brassica napus*) basically delivers two sorts of products: *oil* pressed from rapeseed for industrial processing and, as a by-product, *oilcake* as a high-protein animal feed. Furthermore, rapeseed with its bright yellow flower is a heavy nectar producer, therefore providing a feed resource for beekeepers. In contrast to turnip rape as the ‘unambitious brother’<sup>42</sup>, rape demanded a great deal of its cultivators. A famous textbook for agriculture at that time put it in a nutshell: ‘Most oilseeds make high demands on fertilization, labour and the farm manager’s skills as well as soil and climate; in return, they carry high profits in case of success [...]’.<sup>43</sup> The contemporary agrarian press was full of articles concerning the needs of the rape plant: rape demanded ‘good wheat soils’ and a mild climate; the topsoil had to be loosened carefully several times for weed control; as a ‘fertilizer

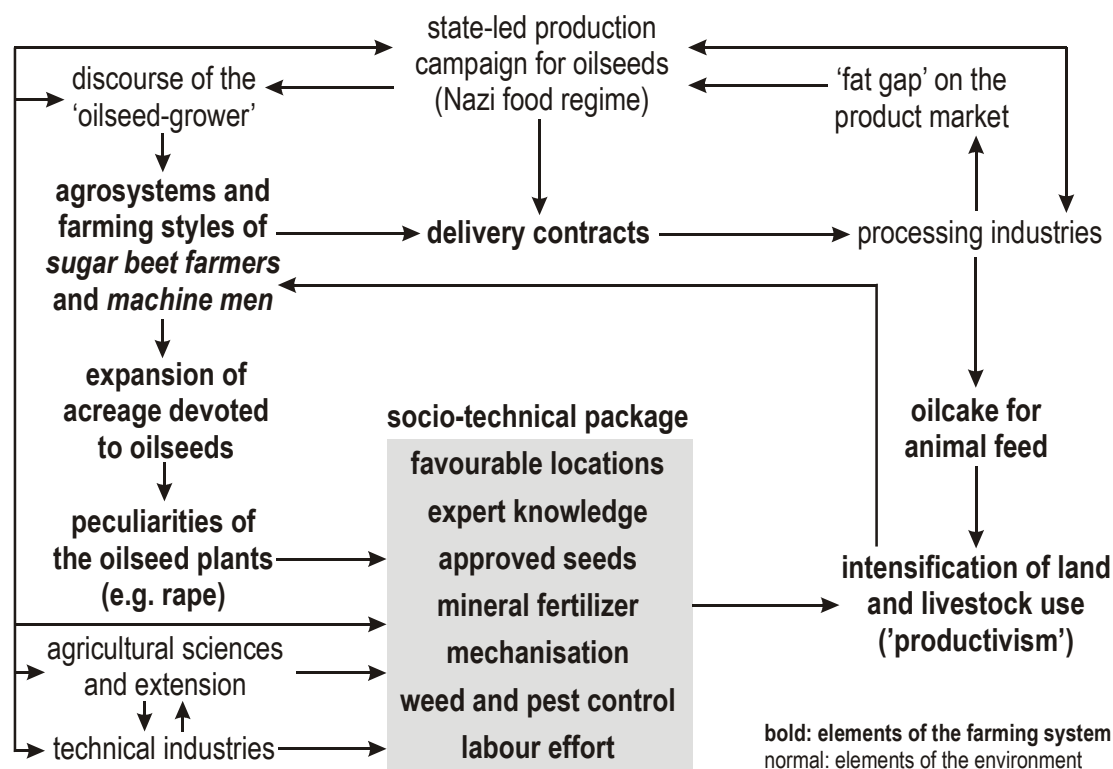
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<sup>41</sup> For the data see NÖLA, BBK Mank, Hofkarten Bischofstetten, Hofkarte no. 40.

<sup>42</sup> *Wochenblatt der Landesbauernschaft Donau- und Danubien* 19/1940, enclosed leaflet.

<sup>43</sup> Guido Krafft, *Lehrbuch der Landwirtschaft auf wissenschaftlicher und praktischer Grundlage*, vol. 2: *Die Pflanzenbaulehre*, Berlin 1913, 84.

guzzler', the growth of the plant required high amounts of organic and mineral fertilizers (about 750 kilos of nitrogen, phosphorus and potassium per hectare); it was recommended to grow 'approved varieties'; adequate treatment of the seeds called for the use of a sowing machine; beehives ought to be placed nearby the fields in order to provide for impregnation; pests such as the sap beetle had to be controlled by physical and chemical counteractions; harvesting and threshing required the use of machines and so on.<sup>44</sup>



Around the rape plant a ‘socio-technical network’ encompassing societal and natural elements emerged (Figure 7). According to its peculiarities, this vegetable organism was far from being passive; like an ‘actor’<sup>45</sup>, it *actively* demanded particular activities from its societal and natural environments: the choice of the location, the improvement of its growth conditions (choice of varieties, supply of nutrients, provision of bees etc.); the worsening of those of its rivals by weed and pest control; careful harvest and storage – in short, adequate thoughts and actions by its cultivating actors. In order to meet these demands, the farm holders had to supply additional expenditures for labour as well as mechanical and biological technology; moreover, since many of

<sup>45</sup> Actor-network theory extends the concept of the ‘actor’ beyond the societal sphere, therefore considering hybrids of human and non-human ‘actants’. See Latour, *Reassembling*, 54 f.

them lacked long-term experiences with the cultivation of rape as a ‘newcomer’, expert knowledge for efficient factor assignment was required. Consequently, rape-growers got more and more interlinked with upstream industries (for machinery, fertilizers, pesticides etc.) as well as research and extension services. Moreover, via delivery contracts for standardised raw materials they got interlinked with downstream industries for processing, which returned products for human and animal feed, namely oil and oilcake, to the rapeseed-producers. These linkages to both factor and product markets were regulated by the agrarian apparatus of the Nazi state via moral impositions (e.g. oilseed-growing as the farmer’s ‘national duty’) as well as economic incentives (e.g. oilseed-growing as a profitable branch of ‘rational farming’). In short, wartime oilseed-growing became a *hybrid* of the co-production of nature and society, amalgamating ecological, economic, political, social and cultural elements to a particular farming style.

#### IV. Conclusion

The central question this article aims at answering is how the ‘macro-project’ of the Nazi food regime was related to the farm holders’ ‘micro-projects’, i.e. their agrosystems and corresponding farming styles. According to the conventional wisdom, one would expect that both domains were more and more disconnected in the course of the war, leading to the extensification of land and livestock use and, thus, the failure of the state-led production campaign. While this simple notion may be appropriate in some respect at the national scale, at the regional and local scales a more complex reality emerges. As the case of wartime oilseed-growing reveals, a relatively successful ‘socio-technical network’ was created – successful not only for the Nazi regime in its attempt to increase the domestic output of oilseeds in order to close the ‘fat gap’, but also for a particular group of well-equipped and profit-oriented farm holders at favourable locations: *sugar beet farmers* and *machine men*.<sup>46</sup> According to the published bookkeeping statistics, grain-winegrowing and grain farms – the land use patterns typical for *sugar beet farmers* and *machine men* – realised net yields of 135 and 87 Schilling per hectare in 1943/44; this was 23 percent above and 9 percent below the

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<sup>46</sup> As a case study for a prosperous well-equipped farm at a favourable location (similar to *sugar beet farmers* and *machine men*) in Austria during the Second World War see Roman Sandgruber, *Der Hof des “Bauern in Hof”. Agrargeschichte des 20. Jahrhunderts im Spiegel von Wirtschaftsrechnungen und Lebenserinnerungen*, in: Franz X. Eder/Peter Feldbauer/Erich Landsteiner (eds.), *Wiener Wege der Sozialgeschichte. Themen – Perspektiven – Vermittlungen*, Vienna/Cologne/Weimar 1997, 299-333.

net yields in 1937.<sup>47</sup> By linking the ‘micro-projects’ of their farm and family lifeworlds to the Nazi system’s ‘macro-project’, they (re-)knotted an actor-network comprising, first, the (self-)image of ‘rational farming’; second, close relations to upstream and downstream industries, agrarian experts and state bureaucracy; third, the intensification of land and livestock use by applying mechanical and biological technology to the agroecosystem of the oilseed-field. Thus, this minority of farm holders became the vanguard of the ‘productivist’ food regime, characterised by (capital-) intensification, concentration and specialisation, which gained hegemony for the majority of the farming community in the postwar period – in Austria and elsewhere.<sup>48</sup>

It goes without saying, that these findings contradict the notion of the ‘anti-modern’ character of agricultural development in the Nazi era. Neither do they support the notion of a ‘state-led agricultural revolution’ as has been outlined for Great Britain in the Second World War.<sup>49</sup> For an accurate re-assessment of the relation of Nazism and agro-modernisation in German-annexed Austria, two points are of utmost importance: First, many decision-makers of Nazi agricultural policy *intended* to modernise Austrian agriculture which they considered to be backward compared to the rest of the German Reich. Second, as the story of Hitler’s oilseed-growers shows, most Nazi projects of agro-modernisation affected the national agrosystem not totally, but only *partially*.<sup>50</sup> All in all, I would conceive Austrian agricultural development in the Nazi era neither an ‘interlude’ or a ‘step backwards’, nor a ‘great leap’ towards agro-modernisation, but an irreversible step along the pathway to the ‘productivist’ food regime unfolding in the postwar period. Thus, the period 1938 to 1945 can be labelled a ‘watershed’ (*Sattelzeit*)<sup>51</sup> of Austrian agricultural development in the twentieth century.

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<sup>47</sup> See Land- und Forstwirtschaftliche Landes-Buchführungsgesellschaft (ed.), *Die Lage der Landwirtschaft der Bundesländer Niederösterreich, Oberösterreich, Steiermark und Kärnten im Berichtsjahr 1946/47*, Vienna 1949, 140. The ‘net yield’ (*Reinertrag*) is the difference on a cash basis between ‘gross yield’ (*Robertrag*) and ‘expenditure’ (*Aufwand*), including assumed family labour wages.

<sup>48</sup> See Brian Ilbery/Ian Bowler, *From Agricultural Productivism to Post-Productivism*, in: Brian Ilbery (ed.), *The Geography of Rural Change*, London 1998, 57-84.

<sup>49</sup> For Great Britain, a ‘state-led agricultural revolution’ in the Second World War has been outlined by Brian Short/Charles Watkins/John Martin (eds.), *The Front Line of Freedom. British Farming in the Second World War*, Exeter 2007. For a comparative perspective on the English and Austrian cases see Ernst Langthaler, *English and Austrian Farming in the Second World War: Revolution or What Else?*, in: Peter Moser/Tony Varley (eds.), *Integration through Subordination. Agriculture and the Rural Population in European Industrial Societies*, Turnhout 2010 (forthcoming).

<sup>50</sup> For source-based case studies supporting both arguments see Langthaler, *Schlachtfelder*.

<sup>51</sup> For the concept of *Sattelzeit* see Reinhard Koselleck, *Vergangene Zukunft. Zur Semantik geschichtlicher Zeiten*, 2nd ed., Frankfurt am Main 1992, 349 ff.; Anders Schinkel, *Imagination as a category of history. An essay concerning Koselleck’s concepts of Erfahrungsräum and Erwartungshorizont*, in: *History and Theory* 44 (2005), 42-54.