The Demand for Seasonal Farm Labor from Central- and Eastern European Countries in German Agriculture

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ABSTRACT

The scope of this analysis is to assess the importance of seasonal farm labor migration from CEE countries for German agriculture beyond the picture of official statistics which is misleading due to the existence of an informal seasonal farm labor market. We calculate seasonal labor requirements per month within German states for a survey of 126 labor intensive crops. The calculated labor requirements enable the analysis of German farm labor demand according to seasonality and regional distribution. In the next step of our analysis, employment figures about the number of seasonal work permits issued by the German labor administration are compared to the calculated labor requirements. Results indicate that the informal labor market remains important, although policy during the eight year survey period has successfully reduced activity within this sector. The future of farm labor migration after eastward enlargement of the EU and recently implemented regulations concerning social security benefits in Germany remains in question.

Keywords: Seasonal labor demand, migration, KTBL, informal employment, shadow economy, labor statistics

1. INTRODUCTION

Fruit, vegetables and horticultural products (FVH) in Germany account for only a fraction of agricultural land, and comparatively few farmers in Germany are involved in their production. Nevertheless, FVH products account for 40% - 50% of sales from crops in Germany (BML/BMVEL 2003). FVH production in Germany is comparatively intensive not only in terms of capital requirements per hectare but also with regard to requirements of manual labor. Therefore, the availability of seasonal farm labor is - in Germany as in many other countries such as the US, Southern Europe or Australia - crucial for the success of this sector.

In this context, German FVH production frequently attracts attention in public discussions because seasonal farm jobs in Germany are filled almost solely by migrant workers from Central and Eastern European Countries (CEECs), despite soaring unemployment rates domestically (Mehrländer et al. 1997; Venema et al. 2002; Dietz 2004). Socio-economic theories provide no single clear explanation for this phenomenon (Chiswick 1999; Lucassen et al. 1999; Martin 2001; Belke et al. 2002) and are not the primary topic of this paper.

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Instead, we take the situation as given and consider seasonal farm labor from CEECs as a necessary input to an economically important branch of German agriculture. Due to its sensitive political context in Germany, this input factor is subject to frequently changing legal conditions (Gerdes 2000 267) that cause uncertainty for both workers and farmers.

In order to control the stream of migrant workers from CEECs, the German government has imposed legal restrictions on the employment of farm workers from outside the EU and the new member states in Eastern Europe. After the EU accession of some CEECs, legal employment of workers from these countries is still restricted in Germany. However, seasonal farm workers from CEECs are allowed to work for up to three months under seasonal work contracts in German agriculture (extended to four months since 2005). In addition to this official sector of seasonal work contracts, an informal seasonal farm labor market exists (Gerdes 2000 267). Due to comparatively open borders, geographical closeness and cultural similarities, farm labor migration from CEECs to Germany has, unlike many other labor migration hotspots, evolved as a system of circulative labor migration without evidence of permanent immigration (Hönekopp 1997).

The goal of this analysis is to support public discussions of this sensitive issue by providing a quantitative assessment of the true seasonal farm labor demand in German FVH production. A reliable estimate of seasonal farm labor demand may help to further quantify the importance of farm labor migration from CEE countries into German agriculture and can shed light on the often cited and controversially discussed informal labor market.

The paper is organized as follows: the next section explains the methodological approach and introduces the database that is used. The third section presents selected results of the analysis that are discussed in section four. Section five concludes.

2. METHOD AND MATERIALS

2.1. Method

From a methodological point of view, the estimation of seasonal farm labor demand in Germany is complicated due to a certain share of informal (illegal, “shadow“) employment must be accounted for (Gerdes 2000 267). For this reason, official statistics about the employment of seasonal farm labor can only account for real employment subject to a measurement error. One approach to rectifying this error would be to survey informal workers and add their estimated total number to the official statistics (Schneider et al. 2000). Even under the unrealistic assumption that official employment figures on seasonal farm labor are consistent over time and representative of a constant share of the total seasonal labor market, informal workers will seldom provide accurate information due in large part to their fear of being caught by authorities. According to Schneider and Enste (2000 p.12), surveys of illegal employment are always biased and should be considered the most conservative estimates of the shadow economy. Alternative methods attempt to measure illegal or irregular activities indirectly and are common within economics (Schneider et al. 2000). These methods utilize the fact that almost all irregular and illegal income generating activities leave traces somewhere in the official statistics, such as in the demand for cash or increased energy consumption (‘input- approach’) that does not correspond to the official

output volume (Schneider et al. 2000, chapter 3).

For the purpose of estimating seasonal farm labor in Germany, this input-approach can be useful because the seasonal labor input is directly linked to the corresponding agricultural output. Any form of seasonal labor input, including legal contract work as well as irregular employment should thus be reflected in the output statistics[1]. Following this approach, we estimate the seasonal farm labor demand in Germany for a set of labor intensive crops and agricultural products on a monthly basis. The methodology is described in this section, followed by a description of the data on labor intensive crops in the following section.

Our calculations of seasonal labor requirements are based on adapted KTBL ("Kuratorium für Technik und Bauen in der Landwirtschaft") values for labor requirements. The KTBL frequently issues figures on input requirements such as labor in German agriculture. These figures reflect contemporary conditions on FVH producing (and other) farms in Germany and are updated frequently (Rohlfing et al. 2002; Weiershäuser 2002). Rohlfing and Schulz (2002) argue that the KTBL values for the vegetable sector may tend to understate the average labor requirements for this research question systematically by 10 % to 15 % because KTBL values tend to be based on rather well managed farms. For special products such as hops and tobacco, tree nursing and ornamental plants, the KTBL values used in this paper have been complemented by information obtained from applied scientists and consultants from state-official research institutions ("Landesanstalten").

In regard to crops for which statistics report an average yield, the marginal labor requirement value[2] is first multiplied by the average yield per hectare and then by the number of hectares, according to the following formula:

$$(SWH/dt_{state})*(Yield/dt_{crop,\ year,\ state})*(Acreage_{crop,\ year,\ state}) = SWH_{crop,\ year,\ state},$$

where SWH = seasonal work hours and the subscript state indexes the 16 German federal states (Länder). For those crops for which average yields are not reported in the official statistics, the KTBL labour requirement per hectare is directly multiplied by the number of hectares planted as follows:

$$(SWH/ha_{state}) * (Acreage_{crop,\ year,\ state}) = SWH_{crop,\ year,\ state}$$

For vegetables in greenhouses as well as for the growing of tree saplings, ornamental plants and root crops, the average yield per hectare can be assumed to bear less information because the conditions are either very stable (greenhouses) or the quantity of plants harvested is of much less interest than the quality. For tree saplings, Christmas trees, medical plants and herbs, our calculations of the average labor requirements are not entirely reliable. However, rough figures have been established from the existing KTBL data on tree sapling nurseries (KTBL 1997) and medical plants and herbs. Especially in case of the latter, very detailed KTBL values are available for each specific product (KTBL 2002b). However, official output

[1] This reasoning assumes, plausibly, that output statistics are more reliable than employment figures.
[2] The 'marginal' seasonal labor requirements per hectare have been obtained from linear regressions without intercept over KTBL labor requirement intervals.

statistics do not provide any matching disaggregation of these products over the surveyed period.

In order to estimate realistically the seasonal distribution of working hours, the calculated number of hours has been evenly split over the months when harvesting, pruning etc. takes place (according to KTBL). This assumption does not reflect the seasonal labor requirements for many crops that vary on a daily basis. The monthly classification intends to reflect the distribution over time rather than the "true" seasonality which is specific for each day and each farm.

For the tasks of cleaning, sorting and storing, the KTBL tables and related literature (KTBL 1993; KTBL 1997; KTBL 2002; KTBL 2002b) provide information on the months in which most of this work usually is done. If no additional months are mentioned for these tasks, it is assumed that the work is performed simultaneously with the harvest and the harvest months from KTBL have been used for the calculations. The output variable thus is determined as "working hours per month and per crop". The results of these calculations form 16 matrices (one for each of the Länder) that consist of 126 rows (crops) and 96 columns (months for the eight year survey period from 1/1994 to 12/2001) each.

2.2. Sample Selection and Data

Statistics on agricultural output in Germany are available for many products over a long period of time. Most products are measured in terms of yield per unit (e.g. tons per hectare) as well as number of units farmed (e.g. hectares planted with strawberries). For 39 vegetables, 9 different fruits, and red and white wine average yields are available for all states and over the entire 1994 to 2001 period.

In order to systematically select a sample of the most manual labor-intensive jobs in FVH production, results from Gerdes (2000 267) are used as a guideline. Gerdes (2000 267) assumes that workers from CEECs tend to be placed in jobs in which the transaction costs of employment are low for the farmer, regardless the legal framework. Due to the socio-economic structure of the seasonal work force and the short duration of their stay, workers from CEECs do not qualify for many tasks on German farms unless the required skills can be learned in a few days and executed without intensive and (costly!) monitoring. Based on the transaction cost approach, Gerdes (2000 267) has surveyed expert groups, namely farmers and consultants, collecting information on their estimates of the transaction costs associated with employing CEE workers for 55 different tasks in German agriculture. The results indicate that the highest demands for seasonal labor per hectare are for asparagus, strawberries, wine, carrots, apples and lettuce - for these crops, experts state that more than 80% of the total labor input required per hectare could be performed by CEE workers at low transaction costs.

The legal framework for seasonal employment (Bundesanstalt für Arbeit 2005) as well as the results in Gerdes (2000) suggest that not only the labor intensive FVH sector may request workers from CEECs but all other farms as well (e.g. dairy operations). However, these other farms are not included in this analysis due to data constraints. Table 1 gives an overview on the groups of FVH products that have been selected.

Table 1: Labor intensive crops included into the survey. Source: (Statistisches Bundesamt 1994 - 2001)

Sector of Agriculture as published by dep. of statistics	No. of crops in data set	Statistical reporting mode
Important Vegetables	38	Annual observations for yield and acreage
Further Vegetables	14	Random samples every fourth year for yield and acreage
Vegetables in Greenhouses	9	Annual report of acreage
Fruit Production	13	Annual harvest reports, No. of trees & acreage counted every 5^{th} year
Ornamental Plants	38	Survey every 4^{th} year
Tree Nursery	5	Survey every 4^{th} year
Perennial crops	4	Annual report of acreage and partially annual harvest report
Annual root crops	3	Annual report of acreage and annual harvest report
Wine Growing	2	Annual report of change in acreage and annual harvest report, count of all wines every 10^{th} year, in other years correction of acreage by annual report of changes
Total	**126**	

2.3. Transforming Seasonal Work Hours into Employment Figures

Transforming the estimated number of seasonal work hours into the number of workers employed in a certain month requires information on the average daily, weekly and monthly number of hours worked per seasonal laborer. We can assume that people traveling from CEECs to Germany in order to generate income have an incentive to work as many hours as possible.

We can further assume that farmers do not have an incentive to employ seasonal workers for any more time than is necessary. As soon as the last unit is harvested and processed, the seasonal workforce will most likely get laid off. At the same time there are usually rainy days that can spoil the quality of the crop to be harvested, or market demand may cause the farmer to delay the harvest, if possible, in anticipation of higher prices. For these reasons, a white range of working hours per day and per week must be examined.

For the purpose of this survey, figures on weekly work hours reported in the literature (Mehrländer et al. 1997; Venema et al. 2002) are used. These weekly estimates are multiplied by four and used as a divisor in order to calculate the seasonal work hours in each month. Gerdes (2000, p.80-81) argues that Mehrländer's results do not reflect the true average number of hours worked per week and mentions the reduced daylight during the survey period. However, the survey by Venema and Grimm (2002), conducted during the summer, finds a different distribution of observations but a very similar mean at roughly 50 working hours per week. Therefore peak observations may lead one to overestimate the *average* number of work hours per week.

3. RESULTS

The calculated figures from our survey allow for various aggregations. The figures below are examples. Further results are available from the author upon request. Figure 1 presents aggregated seasonal farm labor requirements in Germany on a monthly basis. On average, the demand has slightly increased over time. However, the regional distribution of seasonal farm labor demand differs widely between German states.

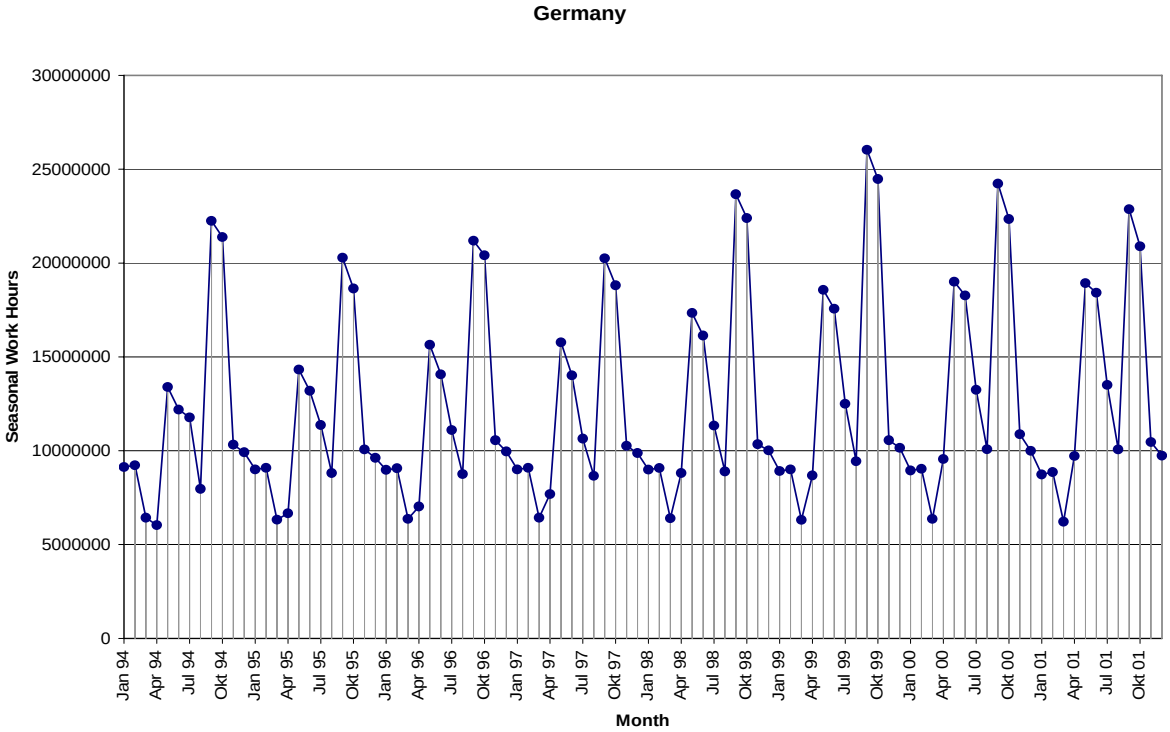

Figure 1. Aggregated Seasonal Farm Labor Requirements per Month in Germany. Source: Own Calculations.

The computed seasonal work hours for all of Germany are the sum of work hours from all sixteen states. The strong "saw-blade" shape of the chart illustrates the seasonal character of German farm labor demand. It has been mentioned that a monthly aggregation of labor requirements does not reflect the real conditions for products such as strawberries or cherries that are often concentrated in several weeks. Nevertheless, this distribution shows significant variation in monthly labor demand. In fact, the chart shows that hardly any month in the 96 month series neighbors two or more months of a similar magnitude of farm labor demand, indicating that most contracts do not last for the maximum duration of three months.

The month with the highest seasonal labor demand for all of Germany appears to be September, according to the eight year average. March shows the least demand for labor except in 1994, when April required the least. The calculation of peak ratios between the highest and the lowest employment month, as described by Martin (1996 p.143-144), yields a

ratio of 3.1 to 1 for 1997 and 3.6 to 1 for 1998. This implies that a whole year average is only a very weak proxy for the seasonal farm labor demand in Germany and somewhat contradicts Hoenekopp (1997) who argues that the full time work equivalent of seasonal farm work in Germany accounts only for a comparatively small number of full-time jobs.

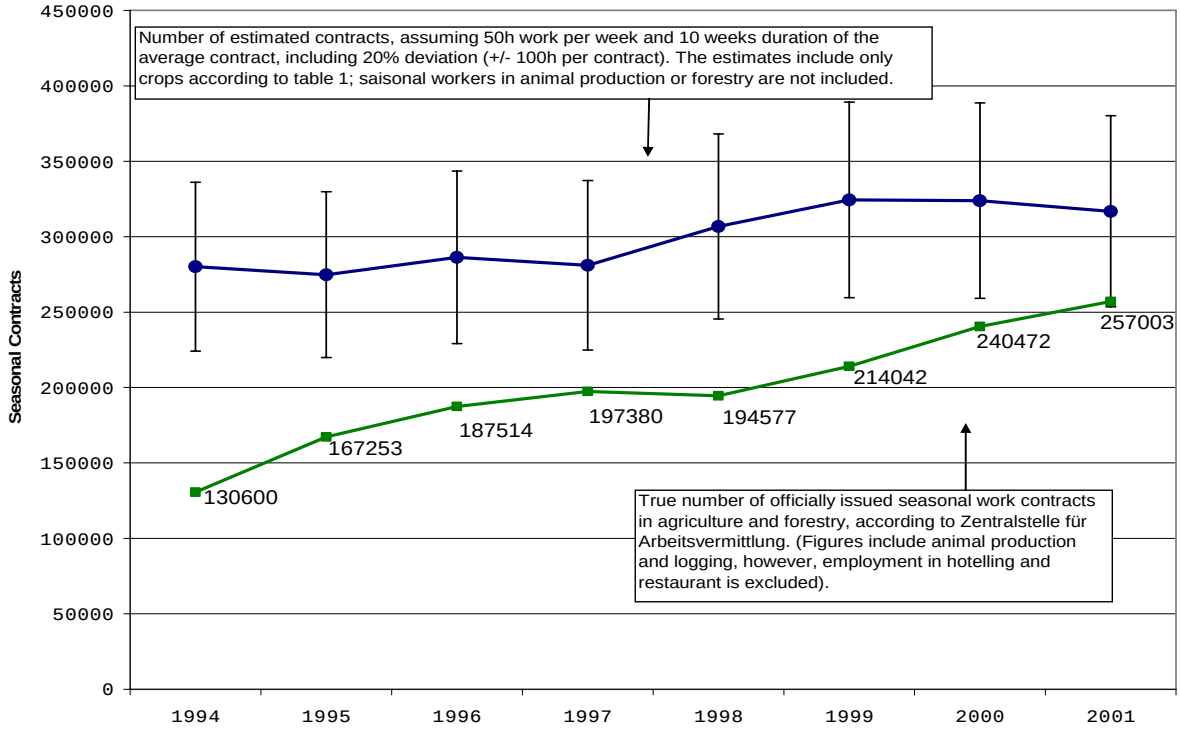

Figure 2. The Estimated Gap between Seasonal Farm Labor Requirements and Officially Issued Work Permits in Germany. Source: Own Calculations.

Figure 2 presents the results of the transformation from seasonal work hours into employment figures. For this purpose, an average duration of 10 weeks for each contract has been assumed. This must be considered a conservative estimate for the following reason: Although a normal contract is issued for a maximum of three months, it is possible to sign contracts for only a few weeks and contracts lasting up to eight weeks can waive certain social security fees that otherwise add to the gross wage employers' have to pay. Furthermore, many crops do not require more than a few weeks of intense harvest work, while sorting, cleaning and packing can be spread over a longer period of time, allowing for less workers to be employed by a farm. Thus it is unlikely that all seasonal workers stay for the full three months. The German labor administration does not keep track of the duration of the contracts issued and does not record the farm types to which the contracts are issued (Abrecht 2002).

Figure 2 compares our estimated labor requirements per year after transformation into yearly employment figures (500hrs per contract) with the official number of contracts issued (Zenralstelle für Arbeitsvermittlung 1994-2001). The vertical lines represent alternative calculations for assumed 400hrs and 600hrs per legal contract, respectively, as a means of gauging the sensitivity of our estimation to this key assumption. The gap between official and calculated employment figures must largely be attributed to informal employment of CEEC workers. The employment of German family members or other seasonal workers for the

surveyed tasks cannot provide a plausible alternative explanation for this gap, as all experts who have been interviewed in connection with the labor requirements per hectare have confirmed. While significant seasonal employment of Germans was still in place during the late 1980s, for instance during the grape harvest, mechanization and CEEC workers have replaced almost all of those jobs by the late 1990s. The gap between the lines in Figure 2 can therefore be interpreted as an estimate of the informal employment of seasonal farm labor in Germany.

Figure 2 points towards another mechanism of interaction between farm labor market segments in Germany: In 1997 and 1998 policy makers in Germany tried to fix the employment of CEEC workers at a quota of 180 000. Figure 2 indicates the German FVH sector continued to expand production during that period, although the political climate did not allow farmers to be sure that more workers would be available. Due to limitations on the number of legal contracts, the informal sector expanded. Although legal workers may have worked many overtime hours during this period, the average employment figures of 500hrs per contract need not necessarily be adjusted for this period because the overtime seasonal farm work of legally contracted workers is often paid informal wages (Cyrus 1997; Mehrländer et al. 1997; Venema et al. 2002).

4. DISCUSSION

Although the overall employment trend for agriculture in Germany is declining, during the survey period there is evidence of a growing demand for hired farm hands in the German FVH sector. These hired workers tend to substitute for family labor and hired domestic workers, as long as long as the mechanization of certain tasks is not technically and/or economically competitive (as an example of the ongoing scientific efforts in this regard compare e.g. Bulanon et al. 2006). However, in the medium run it seems unlikely that most of the manual seasonal farm labor can be mechanized, and therefore the German agricultural sector will continue to employ seasonal labor.

The mobility of domestic German workers into the farm labor sector is reduced due to political reasons that are not subject of this paper. In most cases, the ‘domestic farm worker gap’ in Germany is filled by seasonal farm labor migrants from CEECs. A system of circulative labor migration without evidence of permanent settlement has evolved. Within the farm labor market, official and informal segments co-exist. This paper calculates seasonal labor requirements per month within each German state for a survey of 126 labor intensive crops and products and compares these figures with official employment statistics. The results indicate that the informal labor market remains important although policy during the eight year survey period has successfully reduced activity within this sector. This appears to be the outcome of a more liberal and flexible issuing of seasonal work permits after 1999 going along with tighter controls by German authorities (Abrecht 2002). If restrictions on the number of seasonal contracts were to be strengthened, it can be reasoned that the share of informal employment again were to rise, holding the demand for seasonal farm labor constant. From an economic point of view, this bears the following message for policy making: the expansion of German FVH production paired with the income gradient between Germany and CEEC provide strong economic incentives for seasonal labor migration into Germany. If legal restrictions imposed by policy makers intend to work against these strong incentives, economic activity in FVH production will be ‘forced into the shadow’. However,

from a labor rights perspective, informal employment is always undesirable due to the absence of workers' rights protection, limited bargaining power and sometimes harsh working conditions (Stalker 1994; Martin 1996; Schneider et al. 2002).

As long as the free movement of labor within the EU remains restricted, the future of seasonal farm labor in Germany will likely continue as it did during the survey period. At the same time, farmers can expect mounting restrictions on the employment of workers from CEECs whenever domestic unemployment in Germany is in the focus of political discussions.

5. CONCLUSION

The analysis in this paper has estimated the demand for seasonal farm labor in an alternative way compared with the official statistics on seasonal farm labor employment. The calculations were possible because production data can be regarded as reliable and consistent over time and could be complemented with detailed figures on labor requirements per hectare (KTBL values). The estimated gap between official and total employment of seasonal farm labor must, in addition to the declining share of family labor, be attributed to informal employment. Informal employment is high in years when legal restrictions on the quantity of seasonal work permits were tight. The methodology used in this paper can be continued in order to track future developments of seasonal farm labor and may also be extended to other countries were data on labor requirements and planted acreages, yields, etc. are available. The estimates of shadow employment may also serve as an input to further research, e.g. as a stratification scheme for survey design or as an instrumental variable for farm labor demand estimates.

6. REFERENCES

Abrecht, O. (2002): *Personal Interview*. Bonn, Zentralstelle für Arbeitsvermittlung.

Belke, A. and M. Hebler (2002): *EU- Osterweiterung, Euro und Arbeitsmärkte*. München, Wien, Oldenbourg.

BML/BMVEL (2003): *Agrarbericht der Bundesregierung, various years.* Bonn-Berlin.

Bulanon, D. M., T. Kataoka, Y. Ota and T. Hiroma (2006): A Machine Vision System for the Apple Harvesting Robot. *Agricultural Engineering International: the CIGR Journal of Scientific Research and Development* III (Manuscript PM 01 006).

Bundesanstalt für Arbeit (2005): *Merkblatt für Arbeitgeber zur Vermittlung und Beschäftigung ausländischer Saisonarbeitnehmer und Schaustellergehilfen und Hinweise zum Ausfüllen der Einstellungszusage/des Arbeitsvertrages (Stand: Februar 2005)*. Bonn, Zentralstelle für Arbeitsvermittlung.

Chiswick, B. R. (1999): The Economics of Illegal Migration for the Host Economy. In: International Migration into the 21st Century. M. A. B. Siddique Cheltenham, UK, Nothhampton, MA, USA, Edward Elgar.

Cyrus, N. (1997): In Deutschland arbeiten und in Polen leben- was die neuen WanderarbeiterInnen aus Polen bewegt. *www.polskarada.de/psc.htm, download 15.12.2000, mit Verweis auf www.sw.fh-jena.de/seminare/migration-s97/material/PlSozRat*.

Dietz, B. (2004): Gibt es eine Alternative zur Beschäftigung polnischer Saisonarbeitnehmer in Deutschland? *Osteuropa-Institut München, Working Paper* Nr. 235.

Gerdes, G. (2000): *Bedeutung der Arbeitskräftewanderung aus Mittel- und Osteuropa für den deutschen Agrarsektor*. Agrar- und Ernährungswissenschaftliche Fakultät. Kiel, Christian-Albrechts-Universität**:** 267.

Hönekopp, E. (1997): Labor Migration to Germany from Central and Eastern Europe -Old and New Trends. *IAB Labor Market Topics*(23).

KTBL (1993): *Datensammlung Feldgemüsebau*. Darmstadt, Kuratorium für Technik und Bauen in der Landwirtschaft.

KTBL (1997): *Taschenbuch Gartenbau Landwirtschaft: Daten für die Betriebskalkulation in der Landwirtschaft*. Münster-Hiltrup, Landwirtschaftsverlag.

KTBL (2002): *Obstbau- Betriebswirtschaftliche und Produktionstechnische Kalkulationsdaten*. Darmstadt, Kuratorium für Technik und Bauen in der Landwirtschaft.

KTBL (2002b): *Datensammlung Heil- und Gewürzpflanzen*. Darmstadt.

Lucassen, J. and L. Lucassen, eds. (1999): Migration, migration history, history: old paradigms and new perspectives. Berne, Peter Lang AG.

Martin, P. L. (1996): *Promises to Keep- Collective Bargaining in California Agriculture*. Ames, Iowa, Iowa State University Press.

Martin, P. L. (2001): Economic Integration and Migration: the Mexico-US Experience. In: International Migration into the 21st Century. M. A. B. Siddique Cheltenham, U.K., Northampton, MA., Edward Elgar.

Mehrländer, U., C. Ascheberg and J. Ütz höffer (1997): *Situation der ausländischen Arbeitnehmer und ihrer Familienangehörigen in der Bundesrepublik Deutschland: Repräsentativuntersuchung '95*. Bonn, SIGMA Sozialwissenschaftliches Institut für Gegenwartsfragen und FES- Forschungsinstitut der Friedrich-Ebert- Stiftung, Bundesministerium für Arbeit und Sozialordnung.

Rohlfing, H. and M. Schulz (2002): *Interview*. Landesanstalt für Garten- und Weinbau Oppenheim.

Schneider, D. F. and D. Enste (2000): *Schattenwirtschaft und Schwarzarbeit*. München, Wien, Oldenbourg.

Schneider, F., J. Volkert and S. Caspar (2002): *Schattenwirtschaft und Schwarzarbeit: Beliebt bei Vielen- Problem für Alle*. Baden-Baden, Nomos Verlagsgesellschaft.

Stalker, P. (1994): *The Work of Strangers: A Survey of International Labour Migration.* Geneva, International Labor Office.

Statistisches Bundesamt (1994 - 2001): *Fachserie 3.2. Verschiedene Ausgaben*. Bonn-Berlin, Metzler Verlag.

Venema, M. and K. Grimm (2002): *Situation der ausländischen Arbeitnehmer und ihrer Familienangehörigen in der Bundesrepublik Deutschland, Repräsentativuntersuchung 2001, Teil B Polnische Werkvertragsarbeitnehmer, Gastarbeitnehmer und Saisonarbeitnehmer in der gesamten Bundesrepublik.* Offenbach und München, Forschungsbericht im Auftrag des Bundesministeriums für Arbeit und Sozialordnung.

Weiershäuser, L. (2002): *Email correspondence, telephone interview*.

Zentralstelle für Arbeitsvermittlung (1994-2001): *Arbeitserlaubnisverfahren für ausländische Saisonarbeitnehmer*.