Anne Uhl and Edgar Remmele, Straubing

Small-scaled oilseed processing in Germany

In the middle of 2007, the Centre for Technology and Promotion (TFZ) carried out a Germany-wide written survey among the operators of small-scaled oil mills. Within the past three years, the number of oilseed production plants in Germany more than doubled (2.5 fold). In August 2007, 585 small-scaled oil mills were known. Based on a number of 544 small-scaled oil mills, 889,000 t of rape seed were processed in 2006, and 303,000 t of rapeseed oil as well as 586,000 t of rape cake were produced. The processed quantity of rapeseed corresponds to approximately 16.7% of the German rape harvest [2].

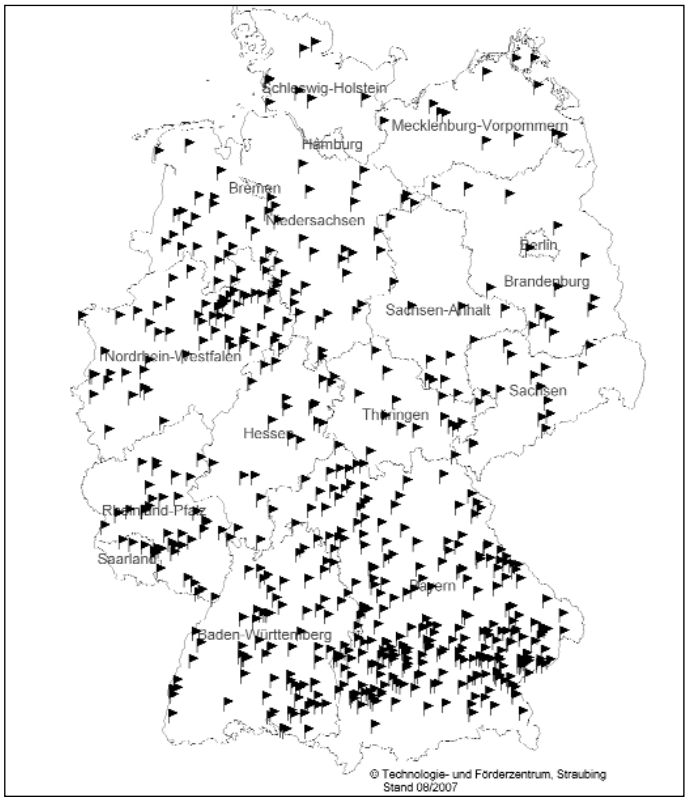

Fig. 1: Locations of decentralized oil mills in Germany – as of August 2007

The goal of the survey was the collection of current data on small-scaled oil milling in Germany. For this purpose, information about technical equipment as well as the mass flows of the raw materials used and the products had to be gathered. In addition, the goal was the registration of data regarding quality management, prices, yields as well as logistics and sales. Moreover, special features of the design of plants for the production of rapeseed oil fuel according to the preliminary standard DIN V 51605 were intended to be determined.

Method

The written survey [5] followed the model of the 2004 survey [3; 4]. In mid-June, 685 questionnaires were mailed to presumed operators of small-scaled oil mills. In addition, all oil mill operators who did not respond were called and asked to do so. Based on the updated address data, a response quota of 34% was reached. Finally, a representative group of 168 oil mills was able to be evaluated based on their locations in the individual federal states.

Results

After 79 oil mills in 1999 and 219 in 2004 [1; 3; 4], at least 585 small-scaled oil mills were operated in August 2007. The locations of the oil mills in Germany are shown in *Figure 1*. Extrapolated theoretical seed processing capacity in 2007 amounted to 1.7 million tonnes (based on operation at rated capacity, a target value of 330 pressing days, and 585 plants). This would correspond to approximately 30% of the German rapeseed harvest [2] in the year 2007.

Most of the oil mills surveyed were built in the years 2005 (24%) and 2006 (35%). 42% of the plants are located in Bavaria. The relatively largest growth in the number of small-scaled oil mills was registered in North-Rhine Westphalia and Lower Saxony, where also the largest average seed processing capacities per plant are recorded.

In 72% of the operations, the main product is rapeseed fuel. Almost three quarters of the operations questioned processed less than 1,000 t of rapeseed per year. 26% of the oil mills pressed more than 1,000 tonnes of rape per year. Of the extrapolated total quantity of the oil produced in small-scaled oil

Dipl.-Ing. Anne Uhl is a scientist, and Dr. Edgar Remmele is director of the Section of Biogeneous Fuels, Lubricants, and Raw Materials in the Centre for Technology and Promotion at the Competence Centre for Renewable Raw Materials, Schulgasse 18, D-94315 Straubing;
e-mail: *anne.uhl@tfz.bayern.de*

The authors would like to thank the Union for the Promotion of Oil and Protein Plants (UFOP) for the financing of the project.

Keywords

Small scaled oil milling, vegetable oil, rapeseed oil as a fuel

mills in the year 2006, approximately 176,000 t were used as rapeseed fuel, while 115,000 t served as base oil for transesterification and 10,000 t as feed oil. 800 t were marketed as edible oil, and 2,000 t were used for other technical purposes. The percentage-wise distribution of the produced oil according to its utilization is shown in *Figure 2*. Almost 100 % of the press cake is used as feed. The largest percentage (58 %) is delivered to feed producers. 42 % of the entire production, however, is sold as individual feedstuff.

On average, 2.1 presses are installed per operation, which altogether provide a seed processing capacity of 375 kg/h. 50 % of the oil mills surveyed operate one press. One quarter has two oil presses integrated into the plant. *Figure 3* shows the percentage of the oil presses of different manufacturers and their percentage in the total processing capacity of small-scaled oil mills. 40 % of all installed presses, for example, come from the manufacturer screwpress GmbH KernKraft – Moosbauer & Rieglsperger (including presses for double pressing), but they only account for 10 % of total processing capacity. The presses of the machine factory Reinartz GmbH & Co. KG, however, account for more than one half (56%) of total processing capacity. The regional orientation of small-scaled oilseed processing is reflected by seed purchasing and product sale. 8 % of the oil mill operators exclusively process oilseeds from their own production and consume the entire press cake in their own operation. 11 % of the oil mills produce oil exclusively for their own purposes. 47 % of those surveyed market oil in an area which on average extends 25 km around their own operation.

More than three quarters of the surveyed operations use a quality management system for at least one of the products of the oil mill. 23 % of the operations are certified according to the QS-standard, and another 26 % of the operations are very small QS-certified producers.

The expectations of the operators of small-scaled oil mills with regard to future chances differ very much and show significant insecurity. In the middle of 2007, the profit margins were often considered too small for the profitable operation of a small-scaled oil mill. In addition, competitive pressure among oil mills is increasing. Due to growing raw material prices and energy tax, the largest part of the operations which produce rapeseed oil fuel regard sales chances as uncertain or are pessimistic. In some cases, they are even considering the closure of the oil mill.

When they were asked whether or not they would build a small-scaled oil mill again, 49 % answered "yes" (2004: 72 %) and 36 % "no" (2004: 17 %) [3; 4]. It is clear that the expectations placed on the operation of a small-scaled oil mill were met to a lesser extent in 2007 than in the past [5].

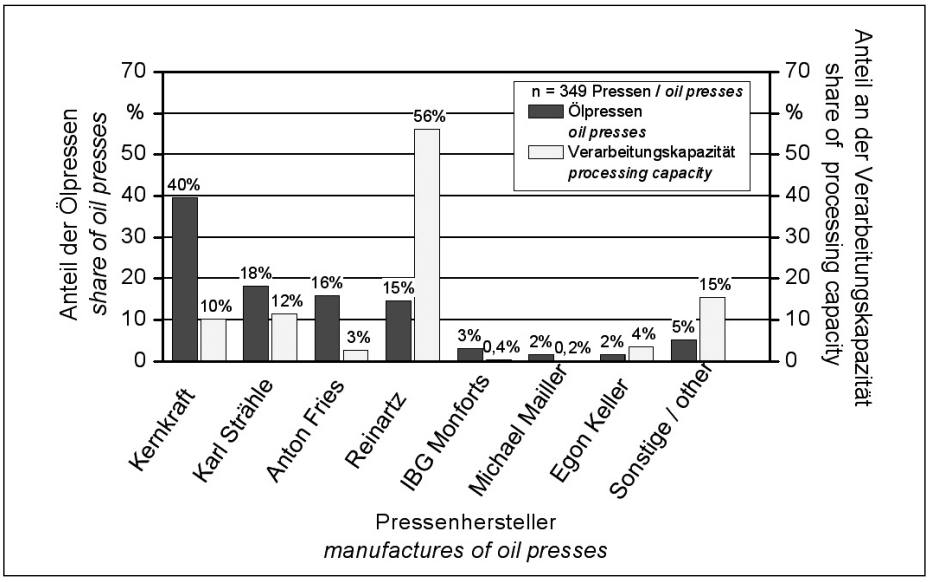

Fig. 3: Share of oil presses from different manufacturers and their share of the total processing capacity

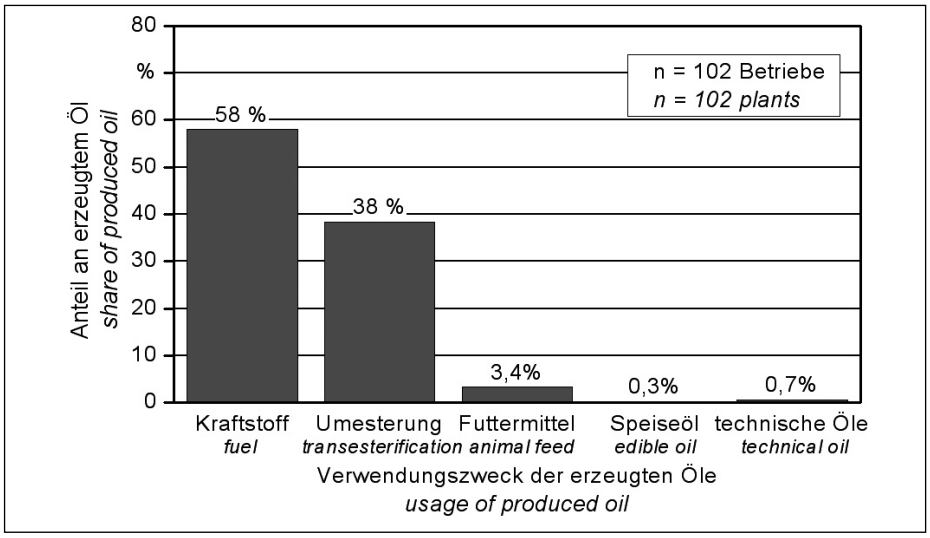

Fig. 2: Usage of the oil processed by decentralized oil mills in 2006

Literature

Books are marked by •

[1] • *Brenndörfer, M.*: Ergebnisse einer bundesweiten Umfrage zum Stand dezentraler Ölsaatenverarbeitung. In: Kuratorium für Technik und Bauwesen in der Landwirtschaft e.V. (Hrsg.): Dezentrale Ölsaatenverarbeitung. Landwirtschaftsverlag GmbH Münster-Hiltrup, Münster, 1999, S. 91-99

[2] *Schenck, W. von*: Rapssaat bleibt gefragt! In: Union zur Förderung von Oel- und Proteinpflanzen e.V. (Hrsg): UFOP-Information Winterrapsaussaat 2007. Berlin, 2007

[3] • *Stotz, K., und E. Remmele* : Daten und Fakten zur dezentralen Ölgewinnung in Deutschland. Berichte aus dem TFZ 3. Eigenverlag TFZ, Straubing, 2005

[4] *Stotz, K., und E. Remmele* : Dezentrale Ölgewinnung. LANDTECHNIK 60 (2005), H. 1 , S. 16-17

[5] • *Uhl, A., R. Haas und E. Remmele* : Befragung von Betreibern dezentraler Ölsaatenverarbeitungsanlagen. Berichte aus dem TFZ 15. Eigenverlag TFZ, Straubing, 2008