

Naked oat cultivation in the Czech Republic

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Overview

The history of naked oat (*A. sativa species nuda L.*) cultivation in Bohemia reaches back to times after the 2nd World War when the Cultivation Station in Krukanice near to Pilsen started to cultivate this variety. The cultivation process was based on a collection of Canadian and Chinese oat varieties supplemented with a set of domestic oat landraces. In 1960, the Krukanicky naked oat variety cultivated from Flämingstreu x Canadian naked oat x Liberty varieties was recognized, but its use was soon restricted because of the low yield. The cultivation of naked oat intermittently continued also in nearby breeding station in Lužany. Here in 1972, the Nucleus naked oat variety was cultivated. In mid-80s, the Czechoslovakia mill-bakery industry had announced its interest in naked oat and asked year production of 10 – 20 000 tons. In 1988 an excellent variety named Adam was cultivated and in following years even better varieties – Abel, Izák, Saul, Otakar, Oliver, Kamil and the latest one named Tibor - were cultivated. The varieties cultivated in the Krukanice cultivation station (Selgen) are characterized by a good yield and quality. Naked oat has become a traditional commodity among producers and processors and now, it has been an interesting export article.

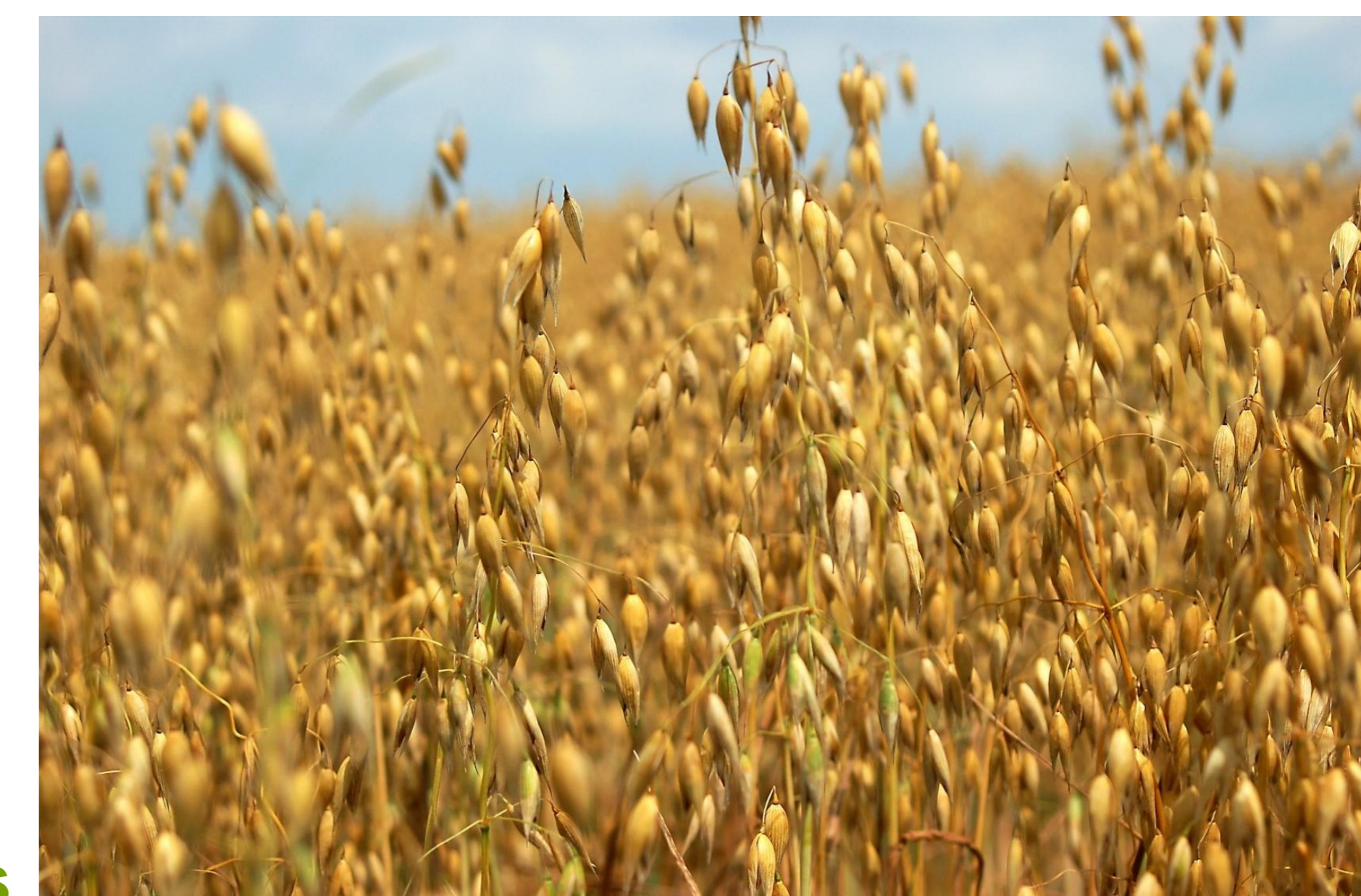


Table 1. Yield given by the Czech varieties related to the Izák variety (%)

	Abel	Izák*	Saul	Otakar	Oliver	Kamil	Standard average t/ha
2003	96	100	101	-	-	-	4,33
2004	98	100	99	-	-	-	6,15
2005	94	100	103	-	-	-	4,78
2006	92	100	98	-	-	-	4,09
2007	95	100	105	-	-	-	4,03
2008	87	100	100	100	-	-	4,66
2009	89	100	90	100	105	101	4,75
2010	92	100	97	104	102	102	3,84
2011	-	100	97	103	104	103	5,62
2012	-	100	102	104	108	104	5,03
2013	-	100	98	100	101	100	5,38

*Izák variety = standard (100 %)

Table 2. The comparison of yields and yield parameters of selected naked and husked oat varieties in years 2008 - 2011 (adjusted according to ÚKZUZ 2012)

Parameter/ Variety	Atego	Raven	Scorpion	Max	Korok	Oliver*	Kamil*	Otakar*	Izak*	Saul*
No. of panicles (m ²)	500	498	511	492	489	436	469	468	473	447
No. grains in a panicle (pcs)	40	39	34	40	40	47	39	42	42	42
HTZ (g)	36	36	42	37	38	27	29	27	27	27
Grain yield (t.ha ⁻¹)	6,93	6,78	7,11	7,02	7,11	4,92	4,82	4,81	4,72	4,52

*Naked oat varieties

Results / Conclusions

Table 1 demonstrates yield growth achieved by naked oat varieties, although there are differences in single years. The difference in grain yield between the naked and husked varieties (Table 2) makes 2.23 t/ha when the naked variety yield reaches 68 % of the yield achieved with the husked varieties. As for the oat rice production, at the yield factor of 90 % for naked oat and 54 % for husked oat (average numbers from praxis over the period of 10 years), the production of oat rice (naked and peeled grains respectively), naked varieties give 0.5 t/ha (13.5 %) higher yield. The occurrence of husked grains, the share of fixed glumes in naked varieties respectively, is dependent on the genotype (the level of naked x husked varieties hybridization) and conditions (humidity, stand lodging). In last 15 years within the Czech variety collection, the share of naked oats with glumes has reduced from 1.0-1.9 % to 0.1-0.4%. Oat, as the crop which is less demanding for additional inputs, resistant to the influences of site conditions and the influence of pathogens and with a number of other positive characteristics, may contribute to the sustainability of farming systems with fewer inputs and in environmentally sensitive areas. The comparison of spring naked oat varieties with hulled varieties shows that the naked varieties have better results in a number of parameters and this gives us the reason for further breeding and cultivation and increase their share in crop rotations.

Keywords: naked oat, hulled oat, grain yield, oat rice

Material and Methods

The small-parcel field experiments with two to six naked oat varieties within the state experiments were started in 9 cultivation centres in three cycles under the same treatment intensity. The climate in the Czech Republic is characterized as a transiting zone between the Atlantic and Continental climate zones. The experimental stations are located in places at the elevation range from 345 to 647 m above sea level, with mean annual temperature in the range of 6.3-8.1 °C and annual rainfall in the range of 537-738 mm. Eutric cambisol / sandy loam-medium are the prevailing soil types. The summary concerns 6 Czech naked oat varieties (Abel, Izak, Saul, Otakar, Oliver and Kamil). The work presents yield assessment results of the mentioned varieties from years 2003-2013. For the comparison of yield differences, 5 naked oat varieties and 5 husked oat varieties were chosen and the yield structure, yield parameter values of those varieties respectively, was evaluated. The quality assessment of naked and husked varieties was based on evaluation of technological and nutritional parameters of grain. At present, the experimental process has been reduced and the naked oat varieties have not already been listed in the catalogue of recommended varieties.

Table 3. Grain quality of the Czech naked oat varieties in years 2008 - 2011 (adjusted according to ÚKZUZ 2012)

Parameter/ Variety	Oliver	Kamil	Otakar	Izak	Saul
Volume weight (kg.hl ⁻¹)	66	68	67	67	67
Solid glumes percentage (%)	0,2	0,1	0,2	0,4	0,3
Grains over (%)	92	96	94	94	91
Nitrogenous substances content in dry matter (%)	13,7	14,2	14,0	14,3	14,3
Fibre content in dry matter (%)	2,1	1,9	2,3	2,3	2,2
Acidity number (mg KOH.g ⁻¹)	14	16	14	14	14
Fat content in dry matter (%)	5,7	7,5	7,0	7,1	5,6



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