

SUNFLOWER SEED STORAGE  
A PROGRESS REPORT

By

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Samples of sunflower seeds of a confectionary type (var. Mingren) and of an oil type (var. Peredovik) of the 1967 crop, of high germinability and free of storage fungi, were conditioned to moisture contents of 9.5 to 14.0%, wet weight basis, stored at temperatures of 5, 10, and 27 C (about 40, 50, and 80 F) and after various lengths of time were tested for germinability and for invasion by storage fungi. Samples with moisture contents of about 4.0% also were exposed to relative humidities of 75, 80, and 85% at a temperature of 25 C (78 F) and allowed to come to equilibrium, after which the moisture content was determined; much information is available on storage behavior of cereal seeds and soybeans with moisture contents in equilibrium with these relative humidities, and it was thought that similar information concerning sunflower seeds would be of value.

The results are summarized in Tables 1 to 5; the data in each table will be commented on briefly.

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Table 1. Moisture content of sunflower seeds in equilibrium with different relative humidities.

<u>Variety</u>	<u>Relative Humidity %</u>		
	<u>75</u>	<u>80</u>	<u>85</u>
Mingren	10.6	11.6	13.3
Peredovik	10.0	11.1	(12.8?)

So far as invasion by storage fungi and accompanying damage is concerned, a moisture content of 10.0% in the seeds of var. Peredovik and of 10.6% in the seeds of Mingren is equal to a moisture content of 14.8 to

15.2% in wheat or corn, and a moisture content of 12.8% in the seeds of Peredovik, and 13.3% in the seeds of Mingren, is equal to about 18.5% in wheat or corn.

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Table 2. Germinability of seeds of var. Peredovik after storage at moisture contents of 9.5 -11.0% for 34 and 82 days. 27 C (80 F)

<u>Moisture Content</u>		<u>% Germination after</u>	
<u>(% Wet Wt.)</u>		<u>34</u>	<u>82 Days</u>
<u>At Start</u>	<u>After 82 Days</u>		
9.5	9.3	98	90
10.0	9.8	99	93
10.5	10.6	99	87
11.0	11.3	99	82

One hundred percent of the seeds of the variety Peredovik stored at moisture contents of 9.5 to 11.0% were invaded by storage fungi within 82 days, and the decrease in germinability was approximately proportional to the increasing moisture content.

Table 3. Sunflower Seed Storage  
27 C (80 F)

<u>Moisture Content</u> <u>(% Wet Wt.)</u>	<u>Variety</u>	<u>% Germination after storage for</u>	
		<u>35</u>	<u>60 Days</u>
10	Mingren	94	87
	Peredovik	96	82
12	Mingren	83	64
	Peredovik	89	30
14	Mingren	74	34
	Peredovik	71	25

Decrease in germinability of seeds of varieties Mingren and Peredovik stored at 27 C (80 F) was approximately proportional to increasing moisture content and increasing time of storage. The samples stored with 12.0%

moisture content were heavily invaded by storage fungi and had decreased greatly in germinability within 60 days.

Table 4. Sunflower Seed Storage

5 C. (40 F)		187 Days
<u>Moisture Content</u> (% Wet Wt.)	<u>Variety</u>	<u>% Germination</u>
10	Mingren	80
	Peredovik	98
12	Mingren	90
	Peredovik	98
14	Mingren	81
	Peredovik	93

Germinability of seeds of varieties Mingren and Peredovik stored for 187 days with moisture contents of 10, 12, and 14% and at 5 C (40 F) did not decrease significantly. That is, low temperature greatly retarded invasion of the seeds by storage fungi and greatly increased the storage life of the seeds, even of those with 14.0% moisture content. Compare with the data in Table 3.

Table 5. Sunflower Seed Storage

10 C (50 F)		Germination % after		
<u>Moisture Content</u> (% Wet Wt.)	<u>Variety</u>	Storage for		
		<u>67</u>	<u>104</u>	<u>183</u> Days
14	Mingren	77	83	74
	Peredovik	95	90	77

Seeds of varieties Mingren and Peredovik with 14.0% moisture and stored at 10 C (50 F) were more slowly invaded by storage fungi, and germinability was reduced much more slowly, than when the seeds were kept at 27 C (80 F). Loss in germinability of the seeds with 14.0% moisture was approximately the same after 35 days at 27 C (Table 3) as after 183 days at 10 C (50 F). That is, a decrease of 17 C (about 30 F) in temperature resulted in a 5-fold increase in storage life of the seeds.

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