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Packing Materials

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PACKAGING MATERIALS

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The materials available for packaging seed are almost as varied as the kinds of seed to be packaged. Most seedsmen are familiar with several different kinds of packaging materials and probably use more than one kind. Choosing a material for packaging can be a major decision for a seedsman. The proper package can mean the difference between a profit and a loss.

The type package you choose will be dependent upon several different factors: (1) the kind of seed to be packaged , (2) how the seed are to be handled, (3) the length of storage time, (4) the storage conditions, (5) are the seed to be shipped, (6) is so where to, and (7) what will be the conditions of shipment. These and other factors influence the selection of packaging materials.

CLASSIFICATION OF PACKAGING MATERIALS

Packaging materials may be classified several different ways. One method of classification is according to moisture resistance.

Materials which offer no resistance to moisture:

This classification consists of such materials as cotton, burlap and paper. Seed packaged in these materials will fluctuate in moisture content as the relative humidity of the air changes. Corn packaged in different type bags at 11.2% moisture and stored in a warehouse without any environmental control varied in moisture content as shown in Table 1, (1).

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Table 1. Moisture variation in corn stored in warehouse at 11.2% moisture (variety CF-78).

Bag Type	% Moisture by months in Storage					
	0	8	16	24	32	40
Polyethylene	11.2	11.1	11.1	10.7	10.5	12.9
Multiwall paper	11.2	11.5	12.2	11.6	12.8	13.2

Since these materials offer no resistance to moisture movement, seed that are to be exposed to high relative humidity conditions for even short periods of time would be expected to be more adversely affected than seed packaged in some type container that offers resistance to moisture movement.

An example of this is given in Table 2, (2).

Table 2. Corn stored at 85°F. - 85% Relative Humidity Packaged at 8.5% Moisture (Variety CF-50).

Bag Type	Test	Months in Storage						
		0	2	4	8	12	16	18
Polyethylene	Std. Germ.	99	98	99	99	98	96	81
	Moisture	8.5	8.6	9.1	9.8	10.6	12.0	11.2
Multiwall paper	Std. Germ.	99	30	1	--	--	--	--
	Moisture	8.5	16.7	15.1		--	--	--
Cloth	Std. Germ.	99	46	2	--	--	--	--
	Moisture	8.5	16.0	17.6	--	--	--	--

On the other hand if seed must be packaged at a slightly higher moisture content than is desirable and are to be stored under dry conditions, these type materials will allow seed to lose moisture. The seed will equilibrate with the storage atmosphere and storability may be increased by this loss of moisture.

Therefore, if seed are to be stored under conditions of low relative humidity or packaged for short periods of time, packaging materials which offer little or no resistance to moisture may be adequate.

Materials which offer slight resistance to moisture:

A second group of packaging materials are those that offer some resistance to moisture movement. Examples of these are metal foils and paper, plastics, asphalt treated paper, plastic coated paper and various combinations of these materials. These materials do not completely inhibit moisture movement, but they restrict moisture movement. Since moisture movement is restricted seed moisture content is more critical when using packaging material of this type than when using packaging materials previously discussed. An example is given in Table 3, (1).

Table 3. Germination and Moisture Content of Soybeans Packaged in Different Materials at Different Seed Moisture Contents in Warehouse Storage.

		Months in Storage					
Bag Type	Test	0	8	16	24	32	40
Polyethylene	% Germ.	97	98	98	94	98	93
	% Moist.	9.0	9.0	9.5	9.4	9.5	9.3
	% Germ.	94	91	91	60	25	20
	% Moist.	11.2	11.1	11.8	11.5	13.8	13.3
Multiwall paper	% Germ.	97	98	96	93	98	95
	% Moist.	9.0	9.4	10.0	9.6	10.5	10.5
	% Germ.	94	95	92	92	90	63
	% Moist.	11.2	11.0	11.6	11.1	10.9	12.1

If seed are to be subjected to adverse conditions during transit or while they are in storage, containers which restrict moisture movement can be valuable in preserving germination and seed quality as shown in Table 2. This type container can be very effective in transoceanic shipment of seed or when shipping seed into tropical areas (2). Studies conducted by the Seed Technology Laboratory show that peanuts shipped to Thailand germinated 86.0% prior to shipment. Seed packaged in cloth bags germinated 33.0% on arrival while those in 10 mil polyethylene germinated 81.0% on arrival. The period of shipment covered four months.

Onion seed shipped to the Philippines germinated 94.0% prior to shipment. Seed packaged in cloth bags germinated 46.0% on arrival, while seed packaged in multiwall paper bags with a laminated plastic liner germinated 89.5% on arrival. The time in shipment was four months.

The benefits of using containers which restrict moisture movement are much more pronounced when packaging seed which do not store well, such as onion and peanuts as well as seed such as corn which stores quite well.

Materials which completely retard moisture movement:

The third group of packaging materials are those which completely retard moisture movement such as metal, glass or plastic coated, heavy cardboard containers. These materials are usually expensive and not always as practical as some of the previously mentioned materials. Very similar results are obtained from packaging seed in moisture resistant materials and moisture proof materials. For example onion seed packaged in metal cans and in multiwall bags with laminated plastic liners germinated equally well after 16 months storage in the Philippines (2).

LITERATURE CITED

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