



# RECYCLED NEWSPAPER FOR ANIMAL BEDDING

## Absorbency and Decomposition

Arthur W. Selders, Extension Specialist-Agricultural Engineering, W. Edgar Hooper, Solid Waste Program Coordinator, Randall A. Childs, Graduate Research Assistant

Farmers have many questions about recycled newsprint as a viable alternate material for animal bedding including absorbency and decomposition of paper bedding. Is recycled newsprint as absorbent as straw and other bedding materials? Does recycled newsprint bedding rapidly decompose when saturated with livestock manure? Will newsprint bedding in animal manures be visible when applied to farmland at normal rates?

### Absorbency of Newsprint

Newsprint absorbency tests reported by Helmlich and Howard were conducted at Ohio State University through a series of trials. The first trials compared absorbency of different sizes and shapes of newsprint. Newsprint was cut into varying sizes, but individual trials contained a constant size or shape as a controlling factor. The sizes tested were strips of full size newspapers 1" x 23", 2" x 23" and 3" x 23", and pieces 6" x 6", 3" x 5" and 2" x 3". The 2" x 3" pieces were compared to other bedding materials in absorbency and saturation trials.

One ounce bundles of newsprint were placed on a flat surface and 100 milliliters of water were poured over the newsprint and allowed to stand for one minute. Excess water was measured and the process repeated until 96 or more milliliters of water was recovered, which usually required three repeat applications. Results are given in Table 1.

Table 1. Water Absorption of Newsprint Bedding

Newsprint Size	Milliliters of Water		
	First Application	Second Application	Third Application
2" x 3"	82	5	0
3" x 5"	72	11	1
6" x 6"	74	12	0
1" x 23"	64	36	2
2" x 23"	77	9	4
3" x 23"	58	24	2

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Observations indicated that chopped pieces tend to absorb more water initially, but by the second addition of water, chopped paper was nearly saturated. The strips of newsprint absorbed water until the third application of water and by the third application of water all sizes of newsprint were wet. The 2" x 3" chopped pieces absorbed the most water, 82 ml, on the initial application, the strips absorbed between 58 and 77 ml on the initial application. Observations indicate that smaller 2" x 3" chopped pieces absorb more rapidly than larger chopped pieces or shredded paper.

### Absorbency of Other Bedding Materials

One ounce samples of sawdust, wood chips, peanut hulls and straw were compared to newsprint for absorbency. Water was applied in 100 milliliter amounts to the samples on a flat surface, allowed to stand for one minute, with excess water measured. Water was applied once for initial absorption, but three trials were completed and the mean amount was used for absorption comparison. Results are given in Table 2.

Table 2. Water Absorption of Sawdust, Wood Chips, Peanut Hulls and Straw Bedding

Bedding Material	Amount of Water Absorbed
	Milliliters
Sawdust	47
Wood Chips	43
Peanut Hulls	23
Straw	34

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### Conclusions

- As predicted, chopped paper absorbed more water than shredded paper.
- Chopped pieces have more broken fibers and thus allow increased absorbency.
- Newspaper absorbs more water than other types of bedding, but does become saturated due to the high rate of absorbency.

- Newsprint is preferable to other bedding materials when considering absorbency alone.

### Decomposition of Newsprint and Other Bedding Materials

Bedding trials have indicated that newsprint has less wet strength than straw. In liquid manure systems newsprint tends to separate into very small pieces during handling and pumping operations, while long fiber straw bedding does not break up as rapidly. Newsprint fibers tend to break apart quite rapidly when saturated with animal manure and applied to land at normal rates. Bedding materials are subjected to a wide variation of moisture saturation depending upon animal species and management practices.

Research studies reported by Rohrer and Heimlich, Ohio State University were conducted to determine comparative decomposition rates for shredded newsprint, straw and sawdust when incorporated into the soil in an outside natural environment.

Three different amounts of each of the three bedding materials were incorporated into soil plots to a depth of approximately 6 inches. The bedding material to soil ratio was about 1:3 and 1:2 in two plots. In the third plot a 3-inch even layer of bedding was placed 6 inches deep and covered with 6 inches of soil. After the plots were established, no additional moisture was added, but natural rainfall kept the soil and bedding material moist, but not saturated. Observations were made 11 days, 5 weeks and 16 weeks after initiation of the tests.

### Conclusions - Implications

- Of the three bedding materials tested the fine shavings and sawdust bedding decomposed most readily in the soil. These materials, when kept

moist, were almost completely decomposed at the end of the 16-week test period.

- The straw was most persistent in retaining its color and strength because of its long fibers.
- The newsprint did decompose or at least disintegrate more quickly than straw when in similar moist conditions in the soil.
- At the end of 16 weeks most of the newsprint and straw was not decomposed.
- Paper bedding will break apart in lagoon systems within 6 hours and in manure-pack barns paper bedding is indistinguishable before removal.
- Straw is a usual component of barns and fields, while paper bedding may be viewed as litter. Management practices for paper animal bedding must include efforts to minimize paper trails. Paper bedding incorporated into animal manure systems will not cause additional problems when applied to land.

- References:
- West Virginia University Energy Extension Service, 1990-91, Demonstration Study, "Recycling Newspapers for Animal Bedding".
  - Heimlich, Joe E. and Sereana Howard, "Absorbency of Newsprint", CDFS-125, 1990, Ohio Cooperative Extension Service, Ohio State University.
  - Rohrer, John D. and Joe E. Heimlich, "Comparative Decomposition Rates for Shredded Newsprint, Straw and Sawdust", CDFS-124, 1990, Ohio Cooperative Extension Service, Ohio State University.

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