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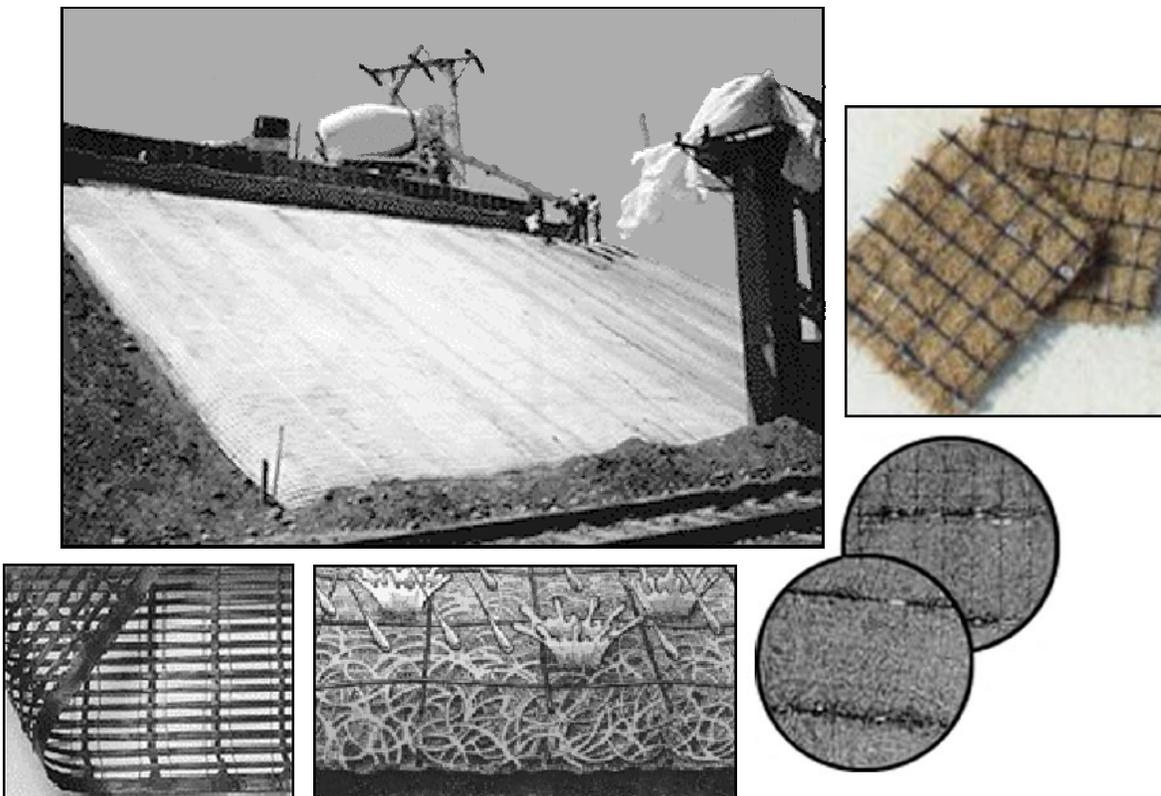
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# Market Analysis of Erosion Control Mats

Brian Shepley  
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## Abstract

Controlling erosion is a serious and challenging task. Annually, erosion is responsible for billions of dollars of damage worldwide. Erosion control mats (ECMs) were developed to control erosion and provide soil stability until vegetation can be established. There are hundreds of products in the erosion control market. Erosion control mats are made from organic materials, synthetic materials, and sometimes a combination of the two. This study is a market analysis of ECMs based on a telephone survey of nine manufacturers and a literature search. The objective of the market analysis was to provide background information and to summarize the ECM industry. The objective of the telephone survey was to determine information about ECMs such as the price, mode of promotion and distribution, most popular product, and current demand and growth potential. The product background section provides a brief description of the most popular types of ECMs. The analysis focuses on the market history, major competitors, major consumers, market size, demand and growth, and the results of a telephone survey. Thirty-eight major competitors were found as well as several major consumers. The telephone survey provided information on current trends in pricing, promotion, and distribution; popular ECM types; and major consumers. The market analysis determined that the market for ECMs will grow based on the fact that the world population is projected to increase, therefore increasing construction of buildings and roads. Also, the fact that some ECMs are made with natural products instead of synthetic products helps them win acceptance in public opinion.

**Keywords:** erosion control mat, market analysis, organic materials, synthetic materials, geosynthetics

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# Market Analysis of Erosion Control Mats

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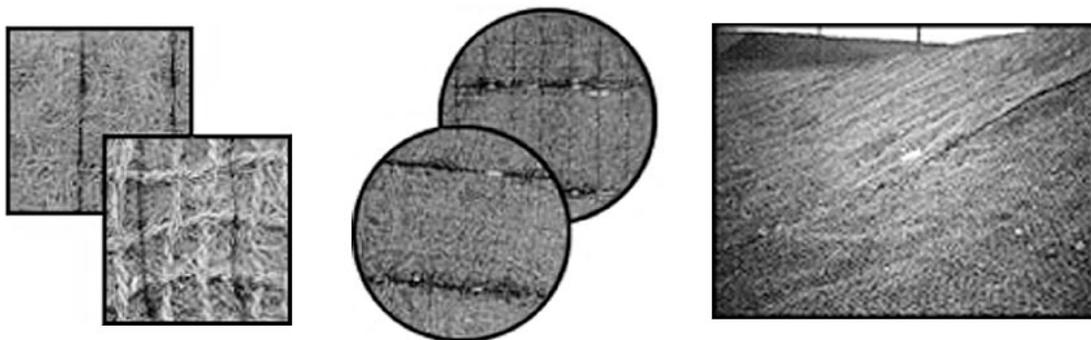
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## Product Background

The erosion control mat (ECM), also called an erosion control blanket or mattress depending on where it is used and what it is made from, is produced in many different sizes, shapes, and patterns to meet a variety of needs. The main purpose of the ECM is to provide soil stability until vegetation can be established (Lancaster 1996). Most ECMs are designed for reinforcement of moderate to steep slopes. Typical applications include roadsides, landfills, ditches, spillways, shorelines, embankments, and moderate to large landscaping projects. There are hundreds of ECM products on the market today. Most ECMs currently on the market fall into the category of rolled erosion control products (RECPs). This term simply refers to erosion control products that are produced in roll style bundles and are applied by simply unrolling them onto the site. Erosion control mats are just one of many products that have been "...designed and engineered to assist landscape contractors to make their projects more economical and easier while still protecting the environment from the impact of erosion and off-site sediment migration." (Roche 1999).

Furthermore, ECMs are categorized into four major groups, depending on what materials they are made from and their lifespan. They are either synthetic or organic and either temporary or permanent. Some mats are made solely from one material and other mats use a combination of two or more different materials to achieve certain properties (Sutherland 1998). The use of synthetic and organic materials together is common. Organic ECMs are often biodegradable and can be more aesthetically pleasing (Roberts 1994). Figures 1 to 3 show examples of coconut, excelsior, and straw organic ECMs. Synthetic erosion control materials, called geosynthetics, are defined as materials that are combined with geological material such as soil and rock to improve or modify the behavior of the geologic material. Geosynthetics include geotextiles, geogrids, geomembranes, geocomposites, and geonets (Sarkar 1998). Figures 4 to 6 show examples of turf reinforcement, concrete, and geosynthetic ECMs. Turf reinforcement ECMs can also be made from organic material. Temporary ECMs are usually organic and made from biodegradable materials. However, some synthetic ECMs are also temporary and are removed after vegetation is established. The majority of the permanent ECMs are composed of either geosynthetics or concrete.



**Figure 1—Coconut fiber mats.** (Used by permission: left and center photos, copyright Aspinwall Group; right photo, copyright Hy-TEX.)

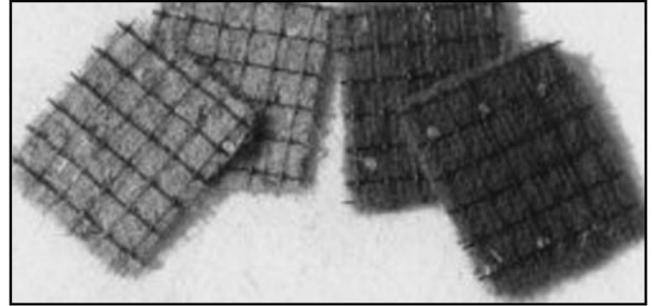
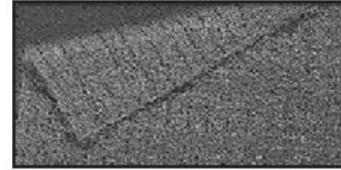


**Figure 2—Excelsior mats. (Used by permission: copyright American Excelsior Company.)**

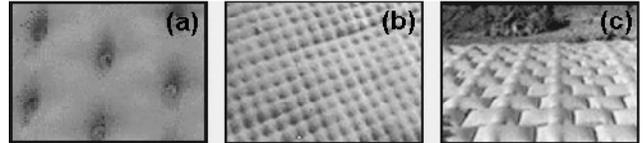


**Figure 3—Straw mats. (Used by permission: copyright Verdylol Alabama, Inc.)**

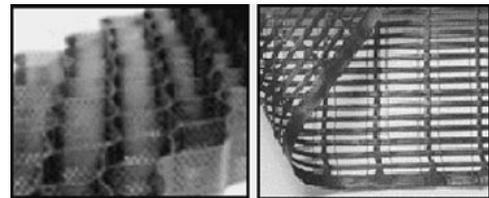
Organic ECMs are considered temporary because they degrade. Degradable ECMs are either completely biodegradable, such as coir (coconut fiber), straw, wood excelsior, and mulch, or biodegradable and photodegradable, such as when these products or other materials are used in conjunction with a lightweight netting or other synthetic material that lasts several months and sometimes several years (Kaspersen 2000a).



**Figure 4—Turf reinforcement mats. (Used by permission: top photo, copyright North American Green; bottom photo, copyright Rolanka International.)**



**Figure 5—(a) Filter point mat, (b) uniform section mat, (c) articulated block mat, (d) concrete mat being used on a slope. (Used by permission: copyright Elish Construction, Inc.)**



**Figure 6—Left: Geoweb System (Presto Products Company, Appleton, Wisconsin); right: geosynthetic mat. (Used by permission: left photo, copyright Presto Products Company; right photo, copyright Maccaferri, Inc.)**

Many factors come into play when deciding what type of ECM should be used at a particular site. The most important factors are listed below (Gannon 1999):

- Type of soil
- Amount of water
- Frequency of water
- Amount of anticipated peak flows
- Terrain
- Run-off direction
- Discharge goals

Complying with local, state, and national laws and regulations is usually the most important objective.

## Product Descriptions

There is a very large number of companies in the erosion control industry, and likewise, there is a large number of products. Erosion control mats are just one of these products, and different companies have many different types and styles of ECMs. However, most of these mats are made of the same materials and are designed to do the same basic job. The following sections describe the most popular and commonly used mat styles and types in the industry (Sutherland 1998).

### Coconut (Coir) Fiber Mats

- Biodegradable, usually woven together, or held together by net or mesh made from jute, coir, or a synthetic material
- May be 100% coconut or combined with straw, excelsior, or other material
- Typically rated for moderate to steep slopes and channel lining
- Can be made to last for short or long periods; durability depends on the mesh of net material used to hold it together and the ratio of coconut to other materials, that is, 70% coconut–30% straw, 50% coconut–50% straw, etc.

### Excelsior Mats

- Produced from wood excelsior (often aspen and poplar)
- Typically composed mostly of a single specified length of fibrous material (6–16 in. (152.4–406.4 mm))
- Usually held together with netting and mesh materials
- Typically recommended for moderate to steep slopes and low-flow ditches
- Biodegradable and can last several years

### Straw Mats

- Made from agricultural wheat straw, sometimes combined with other organic materials such as coconut
- Usually held together by a biodegradable or photodegradable mesh net
- Generally recommended on less steep slopes (maximum slope is 2:1) and very low flow conditions
- Typically a lightweight mat
- Usually lasts less than 2 years

### Turf Reinforcement Mats

- Made from both organic and synthetic materials, including coir and polypropylene
- Used to reinforce vegetation for permanent and temporary applications
- Recommended for use in channels and on slopes

### Concrete Mats

- Basic design is a woven fabric mat that is filled with fine concrete or grout
- Types include the filter point mat, uniform section mat, and the articulated block mat
- Very strong and permanent
- Erosion control uses such as slopes, ditches, spillways, stream banks, and shorelines

### Synthetic (Geosynthetic) Mats

- Many different styles
- Can be composed of polypropylene, polyolefin, polyvinyl chloride (PVC) monofilaments, monofilament yarns, various types of plastics, polyester fibers, and various other geosynthetics.
- Can be photodegradable or permanent
- Can be used to meet a variety of erosion control needs and can be customized to fit special situations

## Market History

Effective erosion control has long been a problem in the United States and around the world. Annually, in the United States, wind and water erosion causes \$17 billion (billion =  $10^9$ ) worth of on-site damage, such as lost soil and nutrients. If off-site damages, such as siltation, drainage, flooding, and undermining of existing structures, are included in this figure, it increases to \$44 billion a year (Kaspersen 2000b). The erosion control industry has grown

tremendously in the past couple decades in response to continued infrastructure development and increased awareness of water quality problems (Allen 1996). During the past 15 years, increasing awareness of environmental degradation and penalties associated with violating certain pollution legislation have created an explosion in the erosion control industry (Sutherland 1998).

Not only is erosion a serious problem, it is an ongoing problem that will probably never be completely resolved. One expert in the erosion control industry said “The job of erosion control will never be done as long as we live on this earth” (Kaspersen 2000b). Further, with population on the rise, erosion control will become even more important. Therefore, the ECM will become an even more important product. Erosion control mats have become very popular in the past decade or two. Today, they are readily available and represent a broad spectrum of product construction and corresponding applications. The use of ECMs continues to grow and expand as a result of technology and demand (Allen 1996).

## Major Competitors

An extensive internet search, including the International Erosion Control Association (IECA) website and the Erosion Control Headquarters website, was completed to come up with a partial list of manufacturers competing in the market for ECMs. Table 1 in the Appendix contains 38 major competitors, located throughout the United States, along with their addresses and contact information. The competitors consisted of 10 manufacturers that produce ECMs composed of a wood-based material, 6 manufacturers that produce concrete ECMs, and 22 manufacturers that use synthetic (including concrete) or organic materials other than wood to produce ECMs.

## Major Customers

Two of the biggest contributors to erosion are construction sites and urban runoff. As a result, two big consumers of ECMs are construction companies and landscape companies (Northcutt 1997). Companies that do highway and road construction make up a large sector of the customer base as well. See the Telephone Survey Results section for more information on major customers.

## Major Market Areas

There are several major market areas for ECMs. The biggest market is probably the highway construction industry. Soil erosion from highway ditches, cut slopes, and fill slopes present a continuous problem for roadway designers, geotechnical engineers, and highway maintenance (Diyaljee and Stoeck 1989, pp. 154–159). The demand from the highway construction industry for an effective erosion control product helped the development of ECMs. Other major markets for

ECMs are landfills, urban and suburban drainage areas (for example, ditches, spillways), building construction, and landscaping. The biggest benefit of using an RECP or similar spray-on product is the reduction in sediment loss from rainfall (Northcutt and McFalls 1998). This is one reason ECMs work well in outdoor construction areas where there could be a large amount of rainfall and high potential for flooding.

During the past decade, there has been growing interest in using channel linings that are natural, environmentally friendly, and less expensive than the synthetic types. This has led to vegetative linings and RECPs (Gharabaghi and others 1998). In addition, there are many environmental movements going on today that encourage the use of natural products as opposed to synthetics. This gives an advantage to organic ECMs, including those produced from wood material. Wood is a natural renewable resource that is safe for the environment and biodegradable. A common wood material used to make ECMs is wood excelsior, which is curled shreds of wood. Excelsior erosion control devices have especially effective sediment capture capabilities (Wagner and Lutyens 1998). With high rates of effectiveness in curbing erosion and the advantage of positive public opinion, it is very likely that wood materials will play a large part in the future production of ECMs and other erosion control products. In a recent study (Demars and others 2001), large-scale erosion control testing was performed at a filed site. Paper mill wood waste, pine bark mulch, a geotextile silt fence, a hay bale barrier, a filter berm of paper mill wood waste, and stump grindings mulch were all tested on their ability to combat erosion by reducing runoff. They were tested on a 1:2 slope in real weather situations for about 5 months from midsummer to early fall. The woody materials were found to be particularly effective in reducing runoff during storms that produced less than 0.5 in. (12.7 mm) of rain. In addition, the wood waste erosion control filter berm was more effective at controlling erosion than either the hay bales or the geotextile silt fence.

## Estimated Market Size

Because erosion control is a worldwide problem, there is no limitation in market size for erosion control products. The capabilities of the individual groups, businesses, and corporations would be the limitations of the market. In 1999, a study was performed by the IECA that involved 124 U.S. erosion control companies. The study found that the total sales volume of erosion control products in 1998 was \$225 million. The IECA predicts this number will grow significantly as more companies agree to share their information and as regional manufacturers are included (Kaspersen 2000b). Geosynthetic mats make up a portion of the \$800 million market of erosion control geosynthetics worldwide (Tilton 1999).

## Current Demand and Growth Potential

Demand for ECMs stems from several different markets and industries, which have already been discussed. The demand for ECMs will fluctuate according to those markets. The use of ECMs faces several challenges (Allen 1996):

- Lack of user education
- Unknown relationship between product properties and actual performance
- Lack of standard testing to evaluate products

If these challenges cause ECMs to perform unsuccessfully, demand for them could decline. However, the Erosion Control Technology Council and other groups are pushing for standardization throughout the erosion control industry, and it is likely to happen in the near future (Allen 1996).

There is great potential for growth in this market. With global population increasing, the markets for ECMs should increase as well. This will be especially true in the construction market as more homes, neighborhoods, and roadways are built. In addition, there are other areas within the erosion control market that could be analyzed. For example, ECMs could be used to reinforce athletic fields, crops, and even lawns.

## Telephone Survey Results

Thirteen companies were randomly selected from the list of ECM manufacturers in Table 1 of the Appendix. Of these companies, nine agreed to participate in the telephone survey. Each company was asked the same five questions dealing with product cost, promotion, distribution, popular products, and largest customers. The questions and results of the survey can be found in Tables 2 to 6 of the Appendix. A summary of the survey results follows.

Most of the organic and synthetic ECMs are priced by the square yard and sold in rolls. However, fabric-formed concrete mats are usually priced according to the job and sold by the square foot. The ECM prices varied according to manufacturer and quality. Wood excelsior had a large price range, from \$.35 to \$.85 per square yard. Synthetic mats are typically more expensive than organic mats, depending on the type and amount of material used. Several companies had higher prices for differentiated products, such as special colored mats (Table 2).

All the companies had websites that advertise their products. In addition, they commonly use trade journals and magazines to advertise, and several companies attend trades shows as well. Several manufacturers advertise in *Erosion Control Magazine*, the magazine of the IECA. Several manufacturers also mentioned that they get a lot of business by word of mouth (Table 3).

Most of the manufacturers sell their product through distributors. Several manufacturers sold direct to end users also. At least one manufacturer provides free shipping to end users within a certain distance of their facility. A few manufacturers had their own trucks to transport their products (Table 4).

Those companies dealing with organic ECMs reported straw ECMs to be their most popular product in the past year. Wood excelsior ECMs were also very popular. Manufacturers that produced both synthetic and organic ECMs said that their organic products have been much more popular than their synthetic ones (Table 5).

Almost all the manufacturers reported the construction industry as one of the biggest consumers of their products, especially road and new construction. Several manufacturers also reported getting business from State Departments of Transportation, landfills, golf courses, and the Army Corps of Engineers (Table 6).

## Conclusion

Controlling erosion is a serious and challenging task. Annually, in the United States and around the world, erosion is responsible for billions of dollars of damage. As a result, ECMs were developed to help control and prevent erosion. There are hundreds of these products in the erosion control market. They are made from organic materials, synthetic materials, and sometimes a combination of the two. In this study, we looked at the market for ECMs. We performed a market analysis and a telephone survey of ECM manufacturers. A big market for ECMs is outdoor construction, especially areas that are subject to large annual rainfalls or are at high risk for flooding. Therefore, construction companies, especially those that do work around roadways, and landscape companies comprise a large portion of the customer base for ECMs. The market analysis determined that the erosion control industry is expected to grow in the future as construction activities increase due to increasing population.

Telephone survey results show the following:

- Most ECMs are priced by the square yard and are sold in rolls.
- Websites, trade journals, and magazines are the most popular promotional tools.
- Most ECM manufacturers sell their products through distributors.
- Currently, the most popular ECMs are those composed of straw.
- The biggest consumer of ECMs is the construction industry.

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## Appendix

**Table 1—Partial list of manufacturers of erosion control products**

Name	Address	Phone / email / website
American Excelsior Company <sup>a</sup>	113 N. Main St. Rice Lake, WI 54868	amex@amerexcel.com www.amerexcel.com/
Buckley Powder Co. <sup>a</sup>	Geo-Fabrics 42 Inverness Drive East Englewood, CO 80112	(303) 790-7008 www.buckleypowder.com
Cady Industries, Inc. <sup>c</sup>	5017 Aviation Way Caldwell, ID 83605	1-888-878-3496 ID@CADYIND.COM www.burlapbags.com/erosion_control.html
Community Construction, Inc. <sup>c</sup>	277 S. Hollywood Rd. P.O. Box 4061 Houma, LA 70361	(504) 868-5239 info@ccihouma.com www.ccihouma.com/
Elish Construction, Inc. <sup>b</sup>	3 South 310 Curtis Avenue Warrenville, IL 60555	(630) 393-6595 www.elish.com/contact.htm

**Table 1—Partial list of manufacturers of erosion control products—con.**

Name	Address	Phone / email / website
Erosion Control Systems <sup>a</sup>	9015 Energy Lane Northport, AL 35476-6542	1-800-942-1986 info@erosioncontrolsystems.com www.erosioncontrolsystems.com/
Foresight Products, LLC <sup>b</sup>	6430 East 49th Drive Commerce City, CO 80022	1-800-325-5360 www.earthanchor.com/
Geostar Corporation <sup>b</sup>	74 Perimeter Center East Suite 7420 Atlanta, GA 30346	1-800-253-0561 www.hydrotex.com/
Greenfix America <sup>a</sup>		(760) 348-7600 www.greenfix.com/
Hydro Terra Products <sup>c</sup>	5310 Valentine Road Wichita, KS 67219	1-800-497-2565 info@hydraterraproducts.com www.hydroterraproducts.com/
JB Instant Lawn, Inc. <sup>c</sup>	5289 Bluegrass Lane Silverton, OR 97381	(503) 581-7823 www.jbinstantlawn.com/index.html
Jensen Precast <sup>b</sup>	5400 Raley Blvd. Sacramento, CA 95838	(916) 991-8800 www.jensenprecast.com/
Keystone Retaining WallSystems, Inc. <sup>c</sup>	4444 West 78th Street Minneapolis, MN 55435	www.keystonewalls.com
Layfield Plastics Ltd <sup>c</sup>	14604-115A Avenue Edmonton, Alberta T5M 3C5, Canada	(780) 453-6731 www.geomembranes.com/
Maccaferri <sup>c</sup>	10303 Governor Lane Blvd. Williamsport, MD 21795	(301) 223-6910 hdqtrs@maccaferri-usa.com www.maccaferri-usa.com/
Manderley <sup>c</sup>	10 Camelot Drive Suite 100 Nepean, Ontario, Canada	1-800-461-5501 info@manderley.com www.manderley.com/
Mat, Inc. <sup>a</sup>	12302 Highway 2 Floodwood, MN 55736 K2G5X8	1-888-477-3028 info@soilguard.com www.soilguard.com/
Midwest Industrial Supply, Inc. <sup>c</sup>	P.O. Box 8431 Canton, OH 44711	(800) 321-0699 www.midwestind.com/
Nedia Enterprises <sup>c</sup>	89-66 217 St Jamaica, NY 11427	(718) 740-5171 nedia@nedia.com www.nedia.com/
North American Green, Inc. <sup>c</sup>	14649 Highway 41 North Evansville, IN 47725	(812) 867-6632 mdarr@nagreen.com www.nagreen.com/
Presto Products Co. <sup>c</sup>	670 N. Perkins St. P.O. Box 2399 Appleton, WI 54912-2399	1-800-548-3424 www.prestogeo.com
Profile Products LLC <sup>c</sup>	750 Lake Crook Road Suite 440 Buffalo Grove, IL 60089	(847) 215-3427 www.profileproducts.com/
ReForestation Technologies International <sup>a</sup>	1341 Dayton Street, Unit G Salinas, CA 93901	1-800-RTI-GROW rti@reforest.com www.reforest.com/

**Table 1—Partial list of manufacturers of erosion control products—con.**

Name	Address	Phone / email / website
Rexius Forest By-Products, Inc. <sup>a</sup>	4490 Main Street Springfield, OR 97477	(541) 342-1835 timf@rexius.com www.rexius.com/
RMC International <sup>c</sup>	96 Voorhis Drive Brentwood, NY 11717	rmc@webspan.net www.webspan.net/~rmc/abcbags.htm
Rolanka International, Inc. <sup>a</sup>	155 Andrew Drive Stockbridge, GA 30281	1-800-760-3215 rolanka@rolanka.com www.rolanka.com/
Royal Enterprises America <sup>b</sup>	30622 Forest Blvd. P.O. Box 119 Stacy, MN 55079	1-800-817-3240 contact@royalenterprises.net www.erosionsolutions.com/
Strata Systems, Inc. <sup>c</sup>	Strata Systems, Inc. 380 Dahlonega Road, Suite 200 Cumming, GA 30040	1-800-680-7750 strata@geogrid.com www.geogrid.com/
Submar, Inc. <sup>b</sup>	805 Dunn Street Houma, LA 70360	1-800-978-2627 submar@cajun.net www.submar.com/
Synthetic Industries <sup>c</sup>	SI Geosolutions 6025 Lee Highway, Suite 435 Chattanooga, TN 37421	1-800-621-0444 sigeo@sind.com www.fixsoil.com/
Tenax Corporation <sup>c</sup>	4800 East Monument Street Baltimore, MD 21205	(410) 522-7000 www.tenax.net/
Tensar Earth Technologies, Inc. <sup>c</sup>	5883 Glenridge Drive Suite 200 Atlanta, GA 30328-5363	(404) 250-1290 www.tensarcorp.com/
The Reinforced Earth Company <sup>c</sup>	8614 Westwood Center Drive Suite 1100 Vienna, VA 22182-2233	1-800-446-5700 info@reinforcedearth.com www.recousa.com/
Thomas Brothers Grass <sup>a</sup>	911 E. Highway 377 Granbury, TX 76048	1-888-NEW-GRASS info@thomasbros.com www.thomasbros.com/
Verdyol Alabama, Inc. <sup>a</sup>	407 Miles Parkway P.O. Box 605 Pell City, AL 35125-0605	(205) 338-4411 verdyol@pell.net http://ero-mat.com/
Webtec, Inc. <sup>c</sup>	P.O. Box 19729 Charlotte, NC 28219	1-800-438-0027 info@webtecgeos.com www.webtecgeos.com/
Westcon <sup>c</sup>	1821 Mayes Road SE Olympia, WA 98503	(360) 456-7580 info@westconpavers.com www.westconpavers.com/

<sup>a</sup>Produce ECMs made from wood materials (may also manufacture synthetic mats).

<sup>b</sup>Produce ECMs made from concrete.

<sup>c</sup>Produce ECMs made from other organic and/or synthetics (concrete included).

## Phone Survey Questions

1. How much does your product sell for?
2. How do you promote your product?
3. How do you distribute your product?
4. What is your most popular ECM product?
5. Where does most of your business come from?

**Table 2—Answers to question 1 from phone survey**

Manu- facturer	How much does your product(s) sell for?
1	Wood excelsior mat by sq. yd., low end \$.35–\$.50, reg \$.38–\$.55, high end \$.65–\$.85
2	Concrete mats, priced by job
3	Straw, coconut, wood excelsior blankets, priced by job
4	Straw, jute, and coconut; no prices given
5	Turf reinforcement mat \$3.50–4.00 sq. yd.; wood excelsior mats \$.50–\$.60 sq. yd.; jute roll \$40, straw roll \$45, wood excelsior roll \$4–\$48
6	Concrete mats, filter point \$.50 sq. ft., uniform section \$.55 sq. ft.
7	Wood excelsior, straw blankets, and synthetics (most expensive) all sold by sq. yd.; no prices given
8	100 sq. yd. roll straw mat \$36, 80 sq. yd. roll wood excelsior mat \$31.20 (dyed green + \$.03 sq. yd.)
9	Woven polypropylene \$.05 sq. ft.; turf reinforcement mat \$.40 sq. ft.

**Table 3—Answers to question 2 from phone survey**

Manu- facturer	How do you promote your product(s)?
1	Website, word of mouth
2	Website, trade journals, word of mouth
3	Website
4	Website, <i>Erosion Control Magazine</i> , <i>Land and Water Magazine</i>
5	Website, trade shows
6	Website, <i>Erosion Control Magazine</i>
7	Website, word of mouth
8	Website, landscaping magazines, trade shows
9	Website, trade journals, <i>Erosion Control Magazine</i>

**Table 4—Answers to question 3 from phone survey**

Manu- facturer	How do you distribute your product(s)?
1	Distributors, sometimes direct to end user by common carrier, free delivery within certain range
2	Common carriers
3	Distributors
4	Distributors
5	Distributor
6	Distributor and direct to end user
7	Distributors, sometimes direct to end user by common carrier or customer pick-up
8	Mostly through distributor, some direct to end user
9	Construction supply distributors

**Table 5—Answers to question 4 from phone survey**

Manu- facturer	What is your most popular ECM product?
1	Wood excelsior (only product)
2	Concrete filter point mat (only produces concrete ECMs)
3	Variable
4	Straw mats
5	Straw mats
6	Concrete filter point mats (only produces concrete ECMs)
7	No single ECM, but organic ECMs much more popular than synthetic ECMs
8	Straw and excelsior mats
9	Polypropylene and turf reinforcement mats (only produces synthetic ECMs)

**Table 6—Answers to question 5 from phone survey**

Manu- facturer	Where does most of your business come from?
1	New construction, DOTs <sup>a</sup> , landfills, and golf courses
2	No response
3	Variable but mostly dealing with construction
4	Lots of DOTs and new construction
5	Highway construction
6	Army Core of Engineers, areas subject to frequent flooding
7	Highway construction, housing developments
8	New construction, contractors
9	Road construction

<sup>a</sup>State Departments of Transportation.