

WT&T  
PROFILE

# The Land Reclamation Market



# GROWTH IN LAND RECLAMATION TO TAKE SIGNIFICANT JUMP

Land reclamation/erosion control could be the BIG Green Industry market of the future. Environmental legislation, especially recent surface mining requirements, are expected to increase dollar volume by nearly 30 percent this year. That is more in one year than experienced in the last five years according to survey respondents in the field. The growth is expected primarily in the area of coal and non-highway public works projects.

WEEDS TREES & TURF polled 1,200 erosion control specialists in the International Erosion Control Association and the Associated Landscape Contractors of America. Ten percent participated in the survey. Respondents included landscape contractors and architects, foresters, engineers, highway maintenance officials, utility personnel, and others.

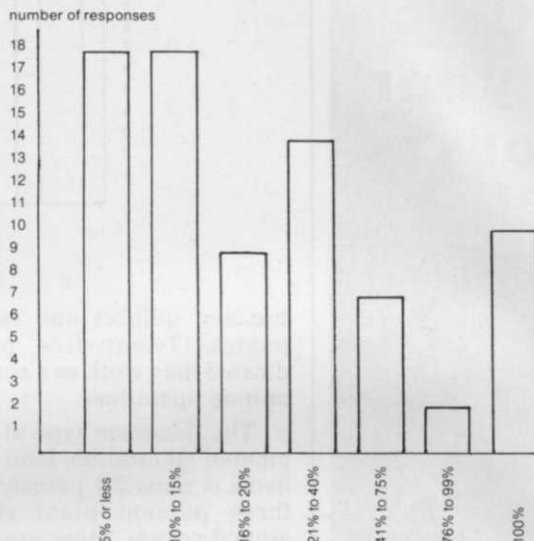
Respondents indicated their primary types of revegetation work at the moment are highway rights-of-way, parks, residential construction sites, industrial construction sites, and utility work sites. Mining site revegetation is performed by only 27 percent of those responding. Reforestation represents only nine percent of the type of revegetation work performed.

The average percentage of gross revenue derived from erosion control was 31 percent with a median response of 20 percent. Ten percent indicated that erosion control makes up 100 percent of gross revenue.

The average volume of erosion control work done in 1977 was \$295,529 with a median of \$75,000. We asked also for volume in 1973 and predicted volume for 1978 to get a picture of market growth. The average volume for erosion control in 1973 was \$277,380 with a median of \$50,000. The predicted average volume for 1978 was \$381,934 with a median of \$150,000.

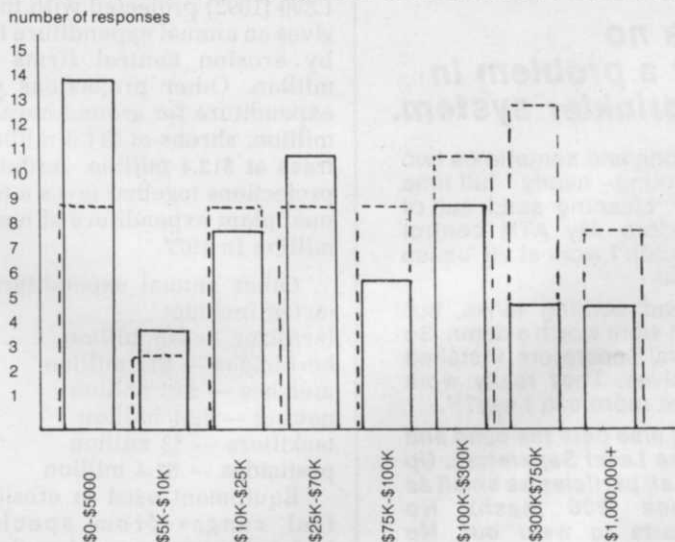
It is evident that a much greater jump in erosion control business is expected this year than has been experienced in the past five years. Projecting the average to 1,200, the base for this survey, the market increased from \$333 million in 1973 to \$355 million in 1977, an increase of \$22 million in five years. In 1978, the market is expected to reach \$458

**Percentage of Gross Revenue** Derived from Revegetation, Erosion Control, or Land Reclamation



**Distribution of Dollar Volume** in Revegetation: 1973-1977.

Distribution of the Dollar Volume of Revegetation Work done in 1973 \_\_\_\_\_  
 Distribution of the Dollar Volume of Revegetation Work done in 1977 - - - - -



million, a jump of \$104 million in one year! Furthermore, when asked about the next five years, respondents predicted an average increase in volume of 117 percent, which would place the market at \$760 million in 1982. We repeat, these market figures are projected from the average volume of erosion control work done by 1,200 firms. Growth in the number of firms, which is very likely in a healthy market, may increase these figures significantly.

Surface mine revegetation alone will grow at a fantastic pace with the help of funds received from taxes on mined coal and distributed to states for reclamation projects. An estimated \$70 million will be spent this way in 1978. Forty percent expect to benefit from mining legislation.

Two thirds of the respondents said they serve as a revegetation consultant to some degree. They consult primarily for public agencies, general contractors, landscape con-

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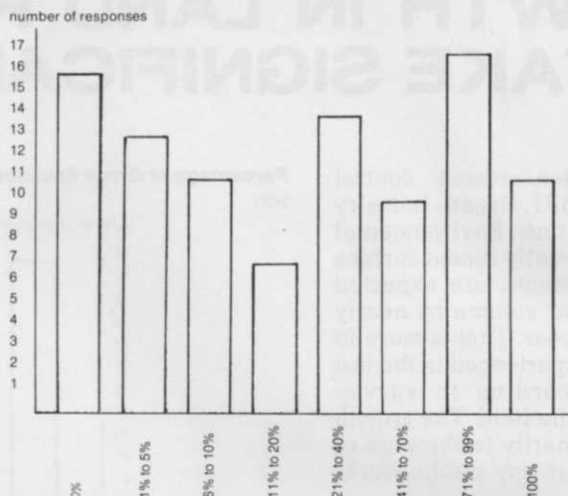
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**Percentage of revegetation Work That is Hydraulic Seeding**



tractors, utilities and mining companies. Twenty-five percent indicated they work as a consultant for mining operations.

The dominant type of vegetation planted on erodible land by respondents is grass (91 percent). Seventy-three percent plant shrubs and ground covers. Trees are planted by 71 percent.

The erosion control firms in this survey spend an average of \$24,834 per year on seed. Using 91 percent of 1,200 (1092) projected with the mean gives an annual expenditure for seed by erosion control firms of \$27 million. Other projections put the expenditure for ground covers at \$5 million, shrubs at \$11.6 million, and trees at \$12.4 million. Adding these projections together gives a total annual plant expenditure of nearly \$44 million in 1977.

Other annual expenditures projected include:  
fertilizer — \$18 million  
herbicides — \$12 million  
mulches — \$13 million  
netting — \$2.1 million  
tackifiers — \$2 million  
pesticides — \$1.4 million

Equipment used in erosion control ranges from specialized hydraulic seeders and mulchers to farm equipment such as seed drills and manure spreaders. The survey was limited to the most common types of equipment.

The following numbers of equipment are projected for 1,200 erosion control firms:

- tractors — 5,000
- dump trucks — 4,200
- tank trucks — 2,250
- hydraulic seeders and mulchers — 1,200
- fork lift vehicles — 1,050
- large earth movers — 604

More than 80 percent of the respondents do hydraulic seeding. Ten percent indicated their business is entirely hydraulic seeding work. The average involvement in hydraulic seeding was 38 percent.

Twenty-one percent do some form of aerial seeding. It makes up an average of 23 percent of the business for these firms.

Finally, we asked if the respondents were familiar with the Surface Mining Control and Reclamation Act of 1977. About half (49 percent) knew of the Act.

A considerably greater amount of research on the reclamation/erosion control market is needed. We hope to have scratched the surface. Since it appears the volume of business in this area is about to jump significantly, research is needed to help manufacturers meet chemical, equipment and supply needs.

Once again, we'd like to stress the projections in this survey are based upon 1,200 names of firms known to be actively involved in erosion control and reclamation in some form. The associations, sources for the survey respondents, probably represent less than the entire market. We encourage anyone considering erosion control or reclamation work to contact regional and national associations to help the market organize for the most efficient growth based on the latest technology and data.

Regional associations can be contacted through state departments of natural resources. At the moment, the International Erosion Control Association, P.O. Box 807, Freedom, Ca. 95019, appears to have the largest membership in the field. The Associated Landscape Contractors of America, 1750 Old Meadow Rd., McClean, Va. 22101, is also active in reclamation technology.

# PEABODY COAL COMPANY: ABIDING BY CHANGING LAWS

The technology of reclaiming surface-mined land has changed greatly in the last 15 years, primarily because laws have mandated what the technology will be and the laws have changed. In 1977, Congress passed the Surface Mining Control and Reclamation Act and the Office of Surface Mining, Reclamation, and Enforcement was created within the U.S. Department of the Interior. Although final regulations are not complete, anticipation of what they will be has created a surge of interest in reclamation of surface-mined land.

One company that has done an admirable job of adjusting to both state and Federal laws is Peabody Coal Co. of St. Louis, Mo. WEEDS TREES & TURF visited Peabody's Broken Aro mine in east central Ohio for a look at the changes of the past 15 years and the reaction to upcoming Federal requirements.

Reclamation supervisor Earl Murphy, a forester by training who joined Peabody from the Ohio Park Service in 1973, described the latest revegetation work performed at Broken Aro, one of two surface

mines owned by Peabody in Ohio.

The difference between revegetation work performed during three separate periods was striking. Reclamation performed prior to 1965 consisted of many small tree-covered hills, many bodies of water and visible high walls. The dense vegetation and craggy terrain offered protection for wildlife inside.

The next method of reclamation, from 1965 to 1972, consisted of striking the tops of spoil piles and planting trees, 900 per acre, and some grass. The most common tree for reclamation has been the black locust.

The third type of reclamation, performed after 1972, consists of gentle rolling hills of grasses and legumes with networks of drainage ditches leading to silt basins. The company that Peabody leases the land from has asked that it be reconstructed to serve as grazing land.

The three-year permit which Peabody has from the state allows mining of approximately 300 acres per year. The mining procedure goes as follows:

- silt basins are constructed
- top foot of soil is removed and stockpiled



**Workers** for the Ohio Mining and Reclamation Association prepare to mulch newly seeded area nearby (top). A silt basin (below) is a vital part of mine reclamation and is usually the first step of the reclamation process. Reclaimed soils can absorb limited quantities of rainfall. Therefore, increased runoff must be handled through special ditches and silt basins.



—bulldozers cut benches in the sides of hills.

—workmen drill down from the benches, explosives are placed in the holes, and set off to loosen the soil above the coal

—dragline removes spoils, then coal  
—spoils are pushed back into the cut by large, double-width blade bulldozers

—spoils are contoured

—topsoil is replaced

—drainage ditches are cut across hillside which feed into large ditches which lead to the silt basins

—lime and fertilizer are applied.

—seed is either drilled or hydraulically sprayed

—straw mulch is applied with straw thrower

—crimper goes over straw to bind it to the topsoil

According to Ohio law reclamation efforts must be current. This is defined as within 500 ft. of the digging site. Therefore, reclamation is a continuation of the mining process which is not complete until vegetation is back in place.

Murphy devised a system to provide hay and straw for mulching from the grasses planted during

reclamation. Although a number of grasses are used, the most common are Kentucky 31 fescue, sweet clover, lespedeza, orchardgrass, and annual and perennial rye. Applying 2½ tons per acre of straw mulch, Murphy hopes to produce most of the 750 tons of straw needed each year.

Lime and fertilizer are applied each spring and fall to the reclaimed areas. Lime is applied originally at six tons per acre. Extra applications may be made based on soil tests taken regularly. The soil is extremely sandy at Broken Aro and mixed with chunks of sandstone. New laws may require all stones larger than six in. be picked up.

Although Murphy doesn't plant many trees on the latest section of Broken Aro, he uses many trees on Simco Mine, Peabody's other surface mine under his supervision.

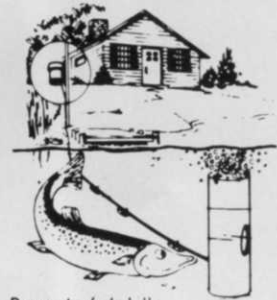
**An example** of reclamation from 1965 to 1972 in Ohio. Highwalls were topped, trees were planted at 900 per acre, and grass was seeded at 12 lbs./acre mainly by plane. Note the area that failed to accept the vegetation.

The types of trees he uses are sweetgum, cottonwood, white pine, black locust, European black alder, and autumn olive. Most of the trees are purchased from state nurseries in vast quantities. Murphy mentioned that river birch showed great promise as a tree in reclaimed areas, but the Indiana nursery stopped producing them. Murphy pointed to healthy patches of grass at the base of nitrogen fixing trees. Some mines are considering harvesting trees on reclaimed land to market as pulpwood.

Perhaps the most unique aspect about reclamation at Broken Aro is that the workers doing the planting are employed by the Ohio Mining and Reclamation Association of Columbus. Peabody is one of approximately 100 members of the association which owns the revegetation equipment, hires the man-



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## Peabody Coal

power, and offers advice. For this service, Peabody pays OMRA an annual dues based upon tonnage of coal produced and an hourly charge for the workers. The revegetation staff of six stays at Broken Aro year-round as does a complete inventory of equipment. Included in the inventory is a Bowie hydraulic seeder, a Finn straw blower, a Brillion seed drill, numerous trucks and tractors.

OMRA is also providing its members with legal assistance on Federal and state reclamation, and is currently lobbying to have air pollution standards adjusted in the state so that Ohio business can burn the high-sulfur coal mined in the state. OMRA works closely with the Ohio Department of Natural Resources which will administer the Federal program when in force. OMRA offers soil and water testing services as well.

Reclamation laws are not perfect, Murphy points out. The requirements discourage removal of

coal left in some older mines, since the older reclamation would have to be redone under current standards if part of the older area was re-affected. Prime farm land is the area facing strictest reclamation standards. Complete return of productivity is required within five years of mining. Nevertheless, Murphy remarked, "If you say current, you practically eliminate erosion and productivity problems."

Like many other surface mines, there are occasionally patches where revegetation didn't work. These patches are the greatest challenge of reclamation today. People like Murphy certainly want to understand why such bald areas occur.

Another lingering question is the upward migration of salts from the spoils. Does it occur often? Why? How can it be prevented?

The mystery about revegetation of surface mines should continue until these questions are fully answered. **WTT**

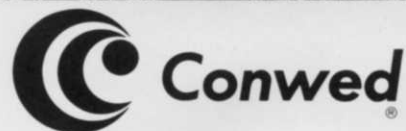
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# SOUTHERN SEEDING SERVICE: 35 YEARS IN EROSION CONTROL

Southern Seeding Service, under the supervision of Ralph D. Stout, Jr. performs erosion control for highways, industrial sites, utility rights-of-way, airports, golf courses, and water and sewage treatment plants in central and eastern North Carolina. "Anywhere the ground has been disturbed presents an opportunity for our services," says Stout.

The business began in 1942, as Southern Mapping and Engineering Company (Southern Seeding Service succeeded this company) based on a need at that time for erosion control on a number of military installations being constructed over the eastern United States. The men who founded the company were agronomists, farmers and engineers with years of experience in the growing of grass and erosion control. Ralph D. Stout, Sr. headed the company at that time. Along with six employees, using antiquated farm equipment, they seeded and grassed airports, army bases, highways and athletic fields. Most of the work was done by hand.

Southern Seeding Service operates office and warehouse facilities in both Greensboro and Raleigh, North Carolina. Most employees are full time with a year round minimum of twenty on the payroll. Southern Seeding Service currently has five superintendents and twenty operators and laborers using the most modern equipment available.

**Southern Seeding's management** (l to r): General Superintendent Vance Kirkman, Resident Engineer Bob Harding, and President Ralph Stout Jr.



"At the present time, the company owns two hydroseeders, a Toro unit and a Finn unit, four Finn mulch spreaders, three asphalt distributors, eleven tractors and twenty-three trucks. The trucks range in size from pick-ups to 10-wheel truck-tractors. Additionally, Southern Seeding Service operates twelve truck trailers along with tag-along trailers, and all the required miscellaneous equipment such as tillers, rollers, spreaders, seeders and harrows needed to operate a business like ours.

"We're basically satisfied with this equipment. We use primarily Ford Industrial tractors, Chevrolet trucks, along with several GMC's. We do have another company Classic Landscapes, Ltd. in Raleigh, which is in the commercial maintenance business, and in my opinion, the equipment they are trying to operate the business with is just not properly designed nor constructed to withstand the rigors of commercial maintenance work," says Stout.

Last year, Southern Seeding Service spent over \$140,000 on equipment maintenance. Certain types of maintenance — painting, minor tune-ups and repairs — are done in-house during the winter. Major engine overhaul, transmission replacement, etc., is normally performed by local dealers.

The company owns all its equipment and purchases \$50,000 to \$75,000 worth a year.

The size of an erosion control project will vary considerably, says

Stout. "Some will go as low as \$700, some as high as \$300,000. We're primarily involved only in establishing the initial vegetation. However, the contracts with the Department of Transportation, here in North Carolina do include maintenance until the job is accepted. "We do some consultant work primarily for industrial sites where we prepare specifications and submit our proposals on same.

"At the present time, we are in the final stages of completing erosion control work on approximately thirty miles of highway between Kinston, NC and New Bern, NC. We had a total of five contracts in this area, two of which have been completed and accepted. Of the three remaining, Robert Merritt is resident engineer on two of the projects and Bob Harding is resident engineer on the third.

"These three project have represented a particular challenge to our people in that when they were bid, they were scheduled for completion in August 1978, November 1978 and December 1978; however, due to the need to get coastal summer traffic on the new road, we have had to re-schedule our men and equipment to complete our portion of the work by the middle of June. When these projects are completed, it will put the traveling public on a four-lane interstate type highway instead of an antiquated two lane road. We are proud of our performance on these projects.

"We spend over two hundred thousand dollars per year on lime, fertilizer, grass seed and the various mulches we use. We use wood cellulose fiber and straw for mulching. The basic agent we use for holding straw is emulsified asphalt. The price is competitive and it's readily available, plus it does a good job for us. I would like to see a material available that would be priced equal and do as good a job but wouldn't be as dirty and hard to handle. We also use a considerable amount of excelsior matting and "Landglas", fiberglas roving.

"Due to the climate in North Carolina most of our jobs here are seeded and there is not much sodding done. We can usually seed, except in the dead of winter, and get

## Southern Seeding Service

reasonable germination. Along the coast, there is some bermudagrass sprigging and beachgrass planting. We've got a job down there, just ready to start, on dune sand that's primarily going to be a sprigging and mulching job.

"We don't see much work coming our way as a result of the Surface Mining Act, mainly because there is not that much mining in the area where we work. We have done some erosion control work for rock quarries; they usually have to take off some overburden, build up a big berm and need to get some erosion control on those areas. We did one job in the mountains for a mica company. They'd had a problem for years, so when we went up and did the work, the newspaper took pictures and wrote it up. We just did our job and Mother Nature took over and made it look good. Sometimes she makes us look bad though.

"The Trade Association that has done the most for us is the Associated Landscape Contractors of America. That's the association for

businesses like ours. We also belong to the North Carolina Landscape Contractors Association which really got started as a result of ALCA involvement. Additionally we're national associate members of the Associated General Contractors of America and associate members of the Carolinas Branch of AGC. As far as industry educational programs go, we feel that we find what we need in ALCA's annual meeting and the programs and seminars they sponsor around the country.

"On the one hand, we see business opportunities for us in the next couple of years, however, the Minority Business Enterprise requirements being pushed by the federal government could adversely affect small businesses like ours. Since the majority of our work is subcontract involving federal money participation, general contractors may find themselves in the position of being unable to subcontract erosion control work to us due to having to conform to the quotas being established by the federal government.

One of the greatest things about our country is that people have the opportunity to do the thing they think they can be most successful in but by the same token, I dislike the prospect that the federal government may legislate us out of business by discriminating against us. We have even considered setting up a minority owned business enterprise which would in actuality only be a sham. We are not willing to play that sort of game so, if Southern Seeding Service gets legislated out of business, Uncle Sam is just going to miss a good tax payer.

"The greatest asset of our company is our people. A few years ago, we brought in some younger people who, while they weren't really professionally trained, had the proper attitudes to come in and learn the business. They're our key people in the field right now. Our philosophy is, "You can have all the equipment in the world and you can have all the money to finance it with, but if you haven't got the folks doing the job, forget it, you've got nothing."

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