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SOURCES OF AGRICULTURAL LIMING MATERIALS.

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INTRODUCTION

A number of factors are in operation today which make the agricultural lime situation somewhat different from that of several years ago. Prices have advanced and transportation charges have increased, while inefficient transportation service renders it difficult for the farmer to secure adequate supplies of necessities. At the same time, the recognition of the need of many soils for basic material is more pronounced so that the whole subject of lime and liming has never been so important. The change in the economic situation makes it more essential than ever that the farmer should be able to secure liming material quickly and at the lowest cost possible. This year many companies producing liming materials will be forced to cancel orders because they will be unable to ship their product. This probably means many farmers will not use lime this year, and if the situation does not improve production will be decreased on those soils which require the addition of lime for the best results.

In the light of these conditions, it was thought desirable to furnish as complete a list as possible of producers of liming materials serving the farmers of the State. Many times, if several sources are available, one can secure liming material more economically by knowing these sources and calculating comparative values.

NECESSITY OF LIME

The necessity of lime on many soils of the State is generally recognized. Unfortunately, in those sections where it is needed most, there are either no supplies or very inadequate supplies of lime. The economic maintenance of soil fertility depends on the

¹ For a more detailed and complete discussion of the subject of ground limestone and its agricultural use see Bulletins Nos. 400 and 430 of this Station.

production of legumes and good crops generally. Many of our most valuable legumes require a large available supply of calcium and a soil of alkaline reaction.

At least 50 to 75 per cent of our soils would be distinctly benefitted by the addition of suitable basic material. It has been satisfactorily demonstrated that a large majority of the soils of the southern half of the State would yield good crops of clover and alfalfa if the necessary conditions were met, conditions which include drainage and lime. Liming material on most of these soils is absolutely essential to the production of these crops.

THE KIND OF LIMING MATERIAL TO USE

There has been much discussion of the comparative merits of various forms of basic material for soils. In general, the matter can be summed up in the single statement: Use the form which is most economical under local conditions. Whether this will be burned lime, hydrated lime, ground limestone, or lime by-products will depend on the following conditions: (1) grade of material as shown by the total available neutralizing ingredients per ton and expressed by the so-called calcium carbonate equivalent, (2) first cost of material, (3) transportation charges per ton, (4) ease of handling, and (5) distance material has to be moved to farm.

When all five points are considered, a good grade of ground limestone (one having a calcium carbonate equivalent of over 90 per cent) will be found, in the majority of cases, to be most economical. However, there are instances in which, for one reason or another some other form of liming material will be more economical as for example in the case of a long haul, high freight charges, excessive prices, or a poor grade of available supplies.

FINENESS OF MATERIAL

The fineness of the material to be used should depend somewhat on the amount applied. This is particularly true of ground limestone. If a small application of 500 to 1000 pounds per acre is made it may be well to have a finer product than if a heavy application is made such as two tons or more per acre. In the former case, a product practically all of which passes a 40-mesh screen would be preferable, while in the latter case, one passing only a 10-

mesh screen would be fine enough. In general, however, it will be more economical of labor to apply two tons once every three to five year rotation than to supply a small quantity each year.

MAGNESIUM LIMESTONES

On the large majority of soils there is no reason for discriminating against magnesium limestones. Based on its chemical action, 84 pounds of magnesium carbonate will have the same neutralizing effect on soil acidity as 100 pounds of calcium carbonate, so that in this respect magnesium stones are superior to calcium limestones. The maximum percentage of magnesium carbonate found in the common limestones of New York is about 45, so that even in the case of such a "dolomite," there would still be some 50 to 55 per cent of calcium carbonate. There are many good magnesium limestones in the State.²

LIMESTONE SCREENINGS AND CRUSHER DUST

Many large companies have a great supply of material as a by-product from the production of crushed stone and frequently this material is of very fair grade and can be obtained cheaply. For example, one company is prepared to furnish such material in bulk car lots at \$1.00 per ton. The material usually runs from one-fourth inch pieces down to fine dust and if applied in quantities of two tons or more per acre would be a very good source of lime, providing analysis did not run too low.

BUYING LIMING MATERIAL

In the case of ground limestone, it is usually cheaper to buy in bulk, that is by the car load. If much liming is to be done and if applications of from 1 to 3 tons per acre are to be made, it will be well worth while to buy in car lots. The cost of sacks and of the labor involved in sacking adds greatly to the cost of the material, usually from \$2.00 to \$4.00 per ton. Ground limestone may be purchased at such a time that it can be hauled directly to the field and applied; or it can be stored, as it keeps indefinitely, altho it should be protected from rain.

² Technical Bulletin No. 47 of this Station.

In buying any kind of lime material, what is desired is the greatest amount possible of available calcium per dollar invested.

CALCULATING COMPARATIVE COST OF MATERIALS

The farmer often has several quotations on different products varying in quality, price, freight rates, and hauling distance. It is always desirable to know which of these products would be most economical when all factors are considered but many times this is a difficult matter to determine. In the first place, analyses of material are not uniform; then the producers guarantee and the actual analyses do not always agree; and, again, different lots from the same quarry or kiln may vary considerably. If the actual calcium carbonate equivalent of the material was known, it would be a relatively simple matter to calculate comparative costs laid down in the field.

Table 1 has been prepared to aid in making such calculations. To use this table, it is necessary to know the following: (1) the approximate calcium carbonate equivalent of the material, (2) the original cost of the material per ton, (3) the freight per ton to destination, and (4) the approximate cost of hauling and application.

If two or more samples are being considered on which any of above items are the same, these items can be left out of the calculation. That is, if two products are being compared on which the freight per ton is the same, or on which the first cost per ton, or any other item is the same, this item does not have to be taken into account. Such a calculation will of course, give the comparative ratio of cost only; that is, it will show which of two or more products is the cheaper to buy. If the actual cost per unit of material is desired, all the above items must be taken into consideration.

The sum of the above items make up what may be called the total cost per ton of material. The calculations given in the table are figured for each \$1.00 of total cost per ton and on a basis of 100 pounds actual calcium carbonate for percentages of calcium carbonate equivalent ranging from 50 to 180. These percentages cover the ranges of low grade and high grade limestone, magnesium limestone, hydrated, and burnt lime, or any other material in which the total carbonates or carbonate equivalents are known.

CALCIUM CARBONATE EQUIVALENT

By this term is meant the total neutralizing ability of any material expressed in percentage of CaCO_3 (calcium carbonate). Analyses

TABLE 1.—DATA FOR CALCULATING COMPARATIVE COSTS OF LIMING MATERIALS HAVING VARIOUS CALCIUM CARBONATE EQUIVALENTS RANGING FROM 50 TO 180 PER CENT.

Cost of 100 pounds CaCO_3 per each \$1.00 total cost per ton.

CaCO_3 EQUIV- ALENTS	COST OF 100 POUNDS CaCO_3	CaCO_3 EQUIV- ALENTS	COST OF 100 POUNDS CaCO_3	CaCO_3 EQUIV- ALENTS	COST OF 100 POUNDS CaCO_3	CaCO_3 EQUIV- ALENTS	COST OF 100 POUNDS CaCO_3
<i>Per Cent</i>	<i>Cents</i>	<i>Per cent</i>	<i>Cents</i>	<i>Per cent</i>	<i>Cents</i>	<i>Per cent</i>	<i>Cents</i>
50.....	10.00	90.....	5.56	130.....	3.85	170.....	2.94
51.....	9.80	91.....	5.50	131.....	3.82	171.....	2.92
52.....	9.62	92.....	5.44	132.....	3.79	172.....	2.91
53.....	9.43	93.....	5.37	133.....	3.76	173.....	2.89
54.....	9.27	94.....	5.32	134.....	3.73	174.....	2.87
55.....	9.09	95.....	5.26	135.....	3.70	175.....	2.86
56.....	8.93	96.....	5.21	136.....	3.68	176.....	2.84
57.....	8.77	97.....	5.15	137.....	3.65	177.....	2.82
58.....	8.63	98.....	5.10	138.....	3.62	178.....	2.81
59.....	8.48	99.....	5.05	139.....	3.60	179.....	2.79
60.....	8.33	100.....	5.00	140.....	3.57	180.....	2.78
61.....	8.20	101.....	4.95	141.....	3.55		
62.....	8.07	102.....	4.90	142.....	3.52		
63.....	7.94	103.....	4.85	143.....	3.50		
64.....	7.82	104.....	4.81	144.....	3.47		
65.....	7.69	105.....	4.76	145.....	3.45		
66.....	7.58	106.....	4.72	146.....	3.42		
67.....	7.47	107.....	4.67	147.....	3.40		
68.....	7.36	108.....	4.63	148.....	3.38		
69.....	7.25	109.....	4.58	149.....	3.36		
70.....	7.14	110.....	4.54	150.....	3.33		
71.....	7.04	111.....	4.50	151.....	3.31		
72.....	6.95	112.....	4.46	152.....	3.29		
73.....	6.85	113.....	4.43	153.....	3.27		
74.....	6.76	114.....	4.39	154.....	3.25		
75.....	6.67	115.....	4.35	155.....	3.22		
76.....	6.58	116.....	4.31	156.....	3.20		
77.....	6.49	117.....	4.28	157.....	3.18		
78.....	6.41	118.....	4.24	158.....	3.16		
79.....	6.33	119.....	4.20	159.....	3.14		
80.....	6.25	120.....	4.16	160.....	3.12		
81.....	6.17	121.....	4.13	161.....	3.11		
82.....	6.10	122.....	4.10	162.....	3.09		
83.....	6.03	123.....	4.07	163.....	3.07		
84.....	5.95	124.....	4.03	164.....	3.05		
85.....	5.88	125.....	4.00	165.....	3.03		
86.....	5.82	126.....	3.97	166.....	3.01		
87.....	5.75	127.....	3.94	167.....	2.99		
88.....	5.68	128.....	3.91	168.....	2.98		
89.....	5.62	129.....	3.88	169.....	2.96		

differ in method of statement. Many companies handling liming materials will give the calcium carbonate equivalent or other analysis when requested to do so. If such analysis is stated in terms of calcium and magnesium oxides, multiply the percentage of calcium oxide (CaO) by 1.8, and the percentage of magnesium oxide (MgO) by 2.1; then add these two results together, and the sum will be the calcium carbonate equivalent of the sample.

If the analysis is stated in terms of calcium and magnesium carbonates, multiply the percentage of magnesium carbonate by 1.2, and add this to the percentage of calcium carbonate. The sum is the calcium carbonate equivalent.

EXAMPLES

In the table, the first column gives the percentage of calcium carbonate equivalent and the second column the cost of 100 pounds actual calcium carbonate per \$1.00 total cost per ton.

Example 1.— It is assumed that two products, both ground limestones, are under consideration. One of these analyzes 85 per cent and the other 95 per cent calcium carbonate equivalent. The former costs \$2.50 at the quarry, the freight rate is \$2.00 per ton, and it costs \$1.50 a ton to haul and apply it to the land. The latter costs \$3.00, freight \$2.50, and hauling and applying \$1.50. This gives the 85 per cent product a total cost of \$6.00 per ton, and the 95 per cent product a total cost of \$7.00 a ton. Looking up these two analyses in the table, we find that in the case of the 85 per cent grade, 100 pounds CaCO_3 cost 5.88 cents, and in the case of the 95 per cent grade, 100 pounds CaCO_3 cost 5.26 cents for each \$1.00 total cost; or for

\$6.00 total cost, 6×5.88 cents = 35.3 cents, and for

\$7.00 total cost, 7×5.26 cents = 36.8 cents.

Therefore, under these particular conditions, the 85 per cent grade would be a little the cheaper. Different conditions, of course, might reverse this.

Example 2.— Again, it is assumed that a burned lime, a hydrated lime, and a ground limestone are under consideration.

The data on the burned lime sample are as follows: CaO, 95.6 per cent; cost per ton, \$12.50; freight per ton, \$3.00; and hauling and applying \$1.50 per ton. The calculation follows:

95.6 per cent CaO $\times 1.8 = 172.0$ per cent CaCO_3 equivalent.
 $\$12.50$ plus $\$3.00$ plus $\$1.50 = \17.00 total cost per ton.

From the table, 100 pounds 172 per cent CaCO_3 costs 2.91 cents per $\$1.00$ cost per ton.

Therefore, $\$17.00$ total cost $\times 2.91 = 49.5$ cents, cost of the material.

The data on the hydrated lime sample are as follows: CaO, 72.2 per cent; cost per ton, $\$15.00$; freight per ton, $\$3.00$; and hauling and applying $\$1.00$ per ton. The calculation follows:

72.2 per cent CaO $\times 1.8 = 130$ per cent CaCO_3 equivalent.

$\$15.00$ plus $\$3.00$ plus $\$1.00 = \19.00 total cost per ton.

From the table, 100 pounds 130 per cent CaCO_3 costs 3.85 cents per $\$1.00$ cost per ton.

Therefore, $\$19.00$ total cost $\times 3.85 = 73.2$ cents, cost of the material.

The data on the ground limestone sample are as follows: CaO, 30.0 per cent; MgO, 20.7 per cent; cost per ton, $\$3.00$; freight per ton, $\$3.00$; and hauling and applying, $\$1.50$ per ton. The calculation follows: —

30.0 per cent CaO $\times 1.8 = 54.0$ per cent CaCO_3 equivalent.

20.7 per cent MgO $\times 2.1 = 43.5$ per cent CaCO_3 equivalent.

54.0 plus 43.5 = 97.5 per cent CaCO_3 equivalent (total).

$\$3.00$ plus $\$3.00$ plus $\$1.50 = \7.50 total cost per ton.

From the table, 100 pounds 97.5 per cent CaCO_3 costs 5.12 cents per $\$1.00$ cost per ton.

Therefore, $\$7.50$ total cost $\times 5.12 = 38.4$ cents, cost of material.

In this example, the ground limestone would furnish the cheapest supply of calcium carbonate.

These examples are merely given to show the method of calculating comparative costs, and may not at all represent actual conditions.

PRODUCERS OF LIMING MATERIALS

In compiling the lists of producers who supply the farmers of New York State with liming materials, it was the endeavor to make them as complete as possible; however, undoubtedly a few have been overlooked. The author here wishes to thank the Farm Bureau Agents of the State for their cooperation in helping to bring up to date the lists given in Tables 2 and 3.

TABLE 2.— PRODUCERS OF LIMING MATERIALS IN NEW YORK STATE, BY COUNTIES.

COUNTY	FIRM NAME AND ADDRESS	LOCATION OF QUARRY	KIND OF LIMING MATERIAL PRODUCED	CAPACITY
Albany.....	1. Callanan Road Imp. Co., South Bethlehem.....	South Bethlehem....	Screenings and ground limestone..	.....
	2. Stephen Day, Ravena.....	Coeyman's Hollow..	Screenings and ground limestone..	.....
Allegany.....	3. Farmer's Lime Co., Burns.....	Canaseraga.....	.....	Large
Broome.....	4. Endicott-Johnson Co., Endicott.....	Factory at Endicott..	Tannery lime.....	.....
Cattaraugus....	5. Eastern Lime & Fert. Co., Franklinville.....	Gasport.....	Ground limestone...	Large
Cayuga.....	6. Cayuga Limestone Co., Union Springs.....	Union Springs.....	Ground limestone...	.....
	7. Doud Limestone Co., Red Creek.....	Victory.....	Ground limestone...	.....
	8. W. H. Moore, Moravia.....	Moravia.....	Ground limestone...	.....
Chautauqua.....	9. Bone Dry Lime Corp., Cassadaga.....	Cassadaga.....	Marl.....	Small
Chemung.....	10. J. Langdon Co., Elmira.....	Pekin.....	Ground limestone...	Large
Chenango.....	No producers.....	.....	.....	.....
Clinton.....	11. Chazy Marble & Lime Co., Chazy.....	Chazy.....	Burnt lime.....	Large
Columbia.....	12. B & B Lime & Stone Co., Mellenville.....	Mellenville.....	Ground limestone...	.....
	13. N. Y. & New England Cement & Lime Co., Hudson.....	Hudson.....	By-product.....	.....
Cortland.....	No producers.....	.....	.....	.....
Delaware.....	No producers.....	.....	.....	.....

Dutchess.....	14. H. S. Carpenter, Stanfordville..... 15. Kelly Island Lime & Transport Company, Buffalo 16. Glen Ford McKinney, 52 William St., N. Y. City. 17. Putnam Lime & Cement Co., 103 Park Ave., New York City.....	Stanfordville..... Dover Plains..... Clove Valley..... Dover Plains.....	Ground limestone... Ground limestone... Ground limestone... Ground limestone, burnt, and hydrated lime.....	Small Large Large Large
Erie.....	18. Kelly Island Lime & Transport Co., Buffalo..... 19. Michigan Limestone Co., Buffalo..... 20. Buffalo Cement Co., Buffalo.....	Buffalo..... Michigan..... Buffalo.....	Ground limestone... Ground limestone...	Large Large
Essex.....	21. N. Y. & Penn. Lime Co., Willsboro..... 22. George Notman, Keene Valley.....	Willsboro.....	By-product..... Ground limestone...	..... .....
Franklin.....	No producers.....	.....	.....	.....
Fulton.....	23. Merl Haines, Mayfield..... 24. Willard Kegg, Cranberry Creek.....	Mayfield..... Cranberry Creek...	Burnt lime and by- product..... Burnt lime and by- product.....	..... .....
Genesee.....	25. LeRoy Lime Company, LeRoy.....	LeRoy.....	Ground limestone...	Small
Greene.....	26. Walter Smith, Catskill..... 27. W. C. Terry, Catskill.....	Catskill..... Athens.....	Burnt and hydrated lime..... Ground limestone...	Small Small Small
Hamilton.....	No producers.....	.....	.....	.....
Herkimer.....	28. Carry Grant, Poland..... 29. John Harris, Middleville..... 30. Newport Stone Co., Newport..... 31. Henry Brewer, W. Winfield..... 32. Christopher Sassman, Salisbury Center..... 33. Mahardy & Murphy, Middleville.....	Poland..... Middleville..... Newport..... W. Winfield..... S. Center..... Middleville.....	Ground limestone... Ground limestone... Ground limestone... Ground limestone... Ground limestone... Ground limestone...	Small Small Small Small Small Small

TABLE 2.—PRODUCERS OF LIMING MATERIALS IN NEW YORK STATE, BY COUNTIES (*continued*).

COUNTY	FIRM NAME AND ADDRESS	LOCATION OF QUARRY	KIND OF LIMING MATERIAL PRODUCED	CAPACITY
Jefferson.....	34. M. E. Lingerfelter, Clayton. 35. Adams & DuFord Co., Chaumont. 36. Holley Case, Dexter.....	Clayton..... Chaumont..... Limerick.....	Ground limestone... Ground limestone... Ground limestone...	Small Large Large
Kings.....	No producers.....	.....	.....	.....
Lewis.....	37. Noel Adams, Harrisville.....	Pitcairn.....	Ground limestone...	Small
Livingston.....	38. Caledonia Chemical Co., Caledonia.....	Caledonia.....	Marl.....	Large
Madison.....	39. A. S. Peck, Valley Mills. 40. Worlock Stone Co., Canastota. 41. Conley Stone Co., Utica.....	Valley Mills..... Blakeslee..... Blakeslee.....	Ground limestone... Ground limestone... Ground limestone...	 Large Large
Monroe.....	42. Dolomite Products Co. Inc., Rochester.....	Lincoln Park.....	Ground limestone...	Large
Montgomery.....	43. H. J. Burkdorf, St. Johnsville. 44. P. V. Baird, Amsterdam. 45. Chalmers Button Factory, Amsterdam. 46. Canajoharie Stone Co., Canajoharie.....	St. Johnsville..... Amsterdam..... Amsterdam..... Canajoharie.....	Ground limestone... Ground limestone... Button waste..... Ground limestone...	..... ..... ..... .....
Nassau.....	No producers.....	.....	.....	.....
New York.....	See Nos. 16, 93, 94, 101, and 108.	.....	.....	.....
Niagara.....	47. Pekin Limestone Quarry, Ransomville. 48. Wickwire Limestone Co., Gasport.....	Pekin..... Gasport.....	Ground limestone... Ground limestone...	Large Large
Oneida.....	49. F. E. Conley Lime & Fert. Co., Utica..... 50. Quentin McAdam, Utica..... 51. Putnam Quarries, Oriskany Falls.....	Munns & Blakeslee... Deansboro..... Oriskany Falls.....	Ground limestone... Ground limestone... Ground limestone...	Large

Onondaga.....	52. W. A. Salisbury, Waterville..... 53. Sugar River Stone Co., Boonville..... 54. Gallagher & Cool, Remsen..... 55. Trenton Lime Co., Inc., Remsen.....	Waterville..... Boonville..... Remsen.....	Ground limestone..... Ground limestone..... Ground limestone..... All forms.....	 Small Large
	56. Rock Cut Stone Co., Syracuse.....	Rock Cut.....	Screenings and ground limestone..	Large Large
Ontario.....	57. Solvay Process Co., Syracuse.....	Jamesville.....	Ground limestone...	Large
Orange.....	58. Geneva Limestone Co., Geneva..... 59. M. M. Leher, Port Jervis..... 60. M. A. Lain, Westtown..... 61. Booth Bros., Goshen..... 62. M. V. B. Horton, Warwick..... 63. James Bull, Monroe..... 64. Harrison & Curtis, Newburg.....	Oaks Corners..... Port Jervis..... Westtown..... Campbell Hall..... Warwick..... Monroe..... Newburg.....	Ground limestone... Ground limestone... Ground limestone... Ground limestone... Ground limestone... Ground limestone... Burnt lime.....	 Small Large Small Small Small Large
Orleans.....	65. Medina Limestone Co., Medina..... 66. R. J. Cole, Clarendon.....	Medina..... Clarendon.....	Ground limestone... Ground limestone...	Large Small
Oswego.....	No producers.....	.....	.....	.....
Otsego.....	67. W. H. Fretz, Richfield Springs..... 68. So. N. Y. Power & R. R. Corp., Cooperstown..	R. Springs..... Cullen.....	Ground limestone... Ground limestone... Ground limestone...	..... ..... .....
Putnam.....	No producers.....	.....	.....	.....
Queens.....	70. Traitel Marble Co., Long Island City.....	L. Island City.....	Marble dust.....	.....
Rensselaer.....	71. Hoosick Lime Co., Hoosick..... 72. H. S. Osgood, Stephentown.....	Hoosick..... Stephentown.....	Ground limestone... Ground limestone...	Small
Richmond.....	No producers.....	.....	.....	.....

TABLE 2.— PRODUCERS OF LIMING MATERIALS IN NEW YORK STATE, BY COUNTIES (concluded).

COUNTY	FIRM NAME AND ADDRESS	LOCATION OF QUARRY	KIND OF LIMING MATERIAL PRODUCED	CAPACITY
Rockland.....	No producers.....	.....	.....	.....
St. Lawrence....	73. Gouverneur Limestone Co., Gouverneur..... 74. Maxner Quarry, Gouverneur..... 75. Noel Aldous, Harrisville, Lewis Co.....	Gouverneur..... Gouverneur..... Pitcairn.....	Ground limestone... Ground limestone... .....	..... ..... .....
Saratoga.....	76. Gailor Stone Co. Inc., Saratoga Springs.....	Saratoga Springs....	Ground limestone...	.....
Schenectady....	No producers.....	.....	.....	.....
Schoharie.....	77. Frank L. Becker, Schoharie..... 78. N. T. Smith, Sharon Springs..... 79. Norton Stone & Lime Co., Cobleskill.....	Schoharie..... Sharon Springs.... Cobleskill.....	Burnt lime..... Ground limestone... Ground limestone...	Large
Schuyler.....	No producers.....	.....	.....	.....
Seneca.....	80. Tunis Bishop, Seneca Falls.....	Fayette.....	Ground limestone...	.....
Steuben.....	No producers.....	.....	.....	.....
Suffolk.....	No producers.....	.....	.....	.....
Sullivan.....	No producers.....	.....	.....	.....
Tioga.....	No producers.....	.....	.....	.....
Tompkins.....	No producers.....	.....	.....	.....
Ulster.....	81. J. A. Hiller, Hurley..... 82. John Basten, Stone Ridge..... 83. Nathan Freer, Katsbaan.....	Hurley..... Stone Ridge..... Katsbaan.....	Burnt lime..... Burnt lime..... Burnt lime.....	Small Small Small

	84. A. J. Snyder & Co., Rosendale.	Rosendale.	Burnt lime.	Large
	85. H. L. Devoe, Accord.	Accord.	Burnt lime.	Large
Warren.....	86. Jointa Lime Co., Glens Falls.	Glens Falls.	Ground limestone.	Large
	87. Finch-Pruyn Co., Glens Falls.	Glens Falls.	Burnt lime.	Large
Washington.....	88. Keenan Lime Co., Smith's Basin.	Smith's Basin.	By-product.	Small
Wayne.....	89. W. A. Plummer Co., Palmyra.	Calcania.	Ground limestone.	Small
	90. Butts Bros., Sodus.	Sodus.	Ground limestone.	Small
	91. Dowd & Teachant, Red Creek.	Red Creek.	Ground limestone.	Small
	92. E. G. Klinck, Wolcott.	Wolcott.	Ground limestone.	Small
Westchester.....	93. Upper Hudson Stone Co., 26 Courtland St., New York City.	Ver Plank.	Ground limestone.	
Wyoming.....	No producers.			
Yates.....	No producers.			

TABLE 3.— PRODUCERS OF LIMING MATERIALS OUTSIDE NEW YORK STATE.

NAME	ADDRESS	LOCATION OF QUARRY
94. Clifford L. Miller	280 Madison Ave., N. Y. City.	W. Stockbridge, Mass.
95. Grangers Lime Co.....	Hartford, Conn.....	W. Stockbridge, Mass.
96. Stearns Lime Co.....	Danbury, Conn.....	Danbury, Conn.
97. Bessemer Limestone Co.....	Youngstown, Ohio.....	.....
98. J. E. Baker Co.....	Bambridge, Pa.....	.....
99. Carbon Limestone Co.....	Youngstown, Ohio.....	.....
100. Clydesdale Lime & Stone Co.	Pittsburg, Pa.....	.....
101. Edison Portland Cement Co.	Stewartsville, N. J.....	.....
102. Kelley Island Lime Co.....	Cleveland, Ohio.....	.....
103. McKeefrey & Co.....	Leetonia, Ohio.....	.....
104. New England Limestone Co.	Adams, Mass.....	.....
105. Norwich Chemical Co.....	Buffalo, N. Y.....	.....
106. Pownal Limestone Co.....	N. Pownal, Vt.....	.....
107. Vermont Marble Co.....	Rutland, Vt.....	.....
108. Palmer Lime & Cement Co....	New York City and York Pa....	.....