

SYSTEM CONFIDENTIAL

ENVIRONMENTAL CASE
RD&E ANNUAL CONFERENCE REPORT

1979

Case Summary

November 14, 1979

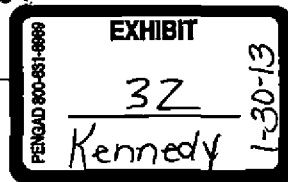
2:00 p.m.

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Environmental Case

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Work continued in all three projects of the Environmental Case to meet their respective objectives:

- Evaluation of the human eye irritation potential of present and proposed product formulations continues under the Eye Toxicology Project (92065) - Fred Ferguson.
- Monitoring of regional vermiculite ores and the worker environment for OSHA - regulated asbestiform minerals continues under the Vermiculite Contamination Investigation (92075) - Al Davidson.
- Studies investigating the fate of fertilizer applied to turfgrass are in progress under the Effect of Fertilizer On Water Quality Project (92085) - Larry Robinson.

I. Summary of 1979 Activity

During 1979 53 product formulations were submitted for eye irritation testing. This brings to a total of 65 formulations that have been submitted since November, 1977 (Appendix I). These represent a total of 21 fertilizers and 44 pesticide formulations. All fertilizers tested now require a CAUTION signal word under criteria of the Consumer Product Safety Commission. Of the 44 pesticides tested; 6 retain the CAUTION designation; 9 are classified as DANGER; and 29 must have a WARNING label.

Forty-three samples of regional vermiculite ores and the worker environment were sampled during 1979. These were subjected to varied test procedures to determine if asbestiform minerals were present. The results are attached (Appendix II). Generally, the ores can be ranked in the following way according to asbestos content: South African << South Carolina = Libby = Virginia. Asbestos fibers have been detected in the worker environment, but these counts are well below maximum tolerable levels.

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The test utilizing the leaching lysimeters near the bypass in Marysville are continuing. All data from this summer and fall are not yet in, but results appear to confirm last summer's data. That is, there appears to be no significant difference in leaching between Turf Builder, Fairway, urea and controls. Much more leaching was noted from ammonium nitrate. No significant difference was noted between 0.45# N/M monthly and 0.9# N/M bi-monthly on leaching. The 2x rate, 1.8# N/M bi-monthly caused the most leaching.

This year an improved irrigation system was installed which should allow better detection of differences among treatments due to more uniform watering.

An updated report is due from Dr. George Snyder in Fort Lauderdale. His preliminary results showed most leaching occurred from $\text{Ca}(\text{NO}_3)_2$ and urea, with much less from IBDU, MU (34% CWIN), SCU-64, SCU-8, Check, TVA-SCU and UF (in that order).

A "Fate of Nitrogen" Workshop is scheduled for November 29 and 30, 1979. The objective of the workshop is to bring together a group of experts of diverse backgrounds to discuss the problems associated with nitrate pollution. To be considered are the following:

1. The scope of the pollution problem.
2. Factors which minimize the pollution.
3. Directions for future research.

II. Plans and Objectives - 1980 Program

Twenty-two retail products and 39 ProTurf products require new eye toxicology testing. This testing will be done by November, 1980.

A proposed sampling protocol for monitoring asbestos is currently being circulated for approval and adoption (Appendix III). Sampling of regional vermiculite ores and the worker environment for the presence of asbestiform minerals will continue.

The barrel leaching study in Marysville and the Fort Lauderdale study will continue for one year or more. In addition, porous cups should be installed in Marysville in order to collect leaching data under more natural conditions.

0. 25% (200) 浓度的溶液, 立即加入 1 滴 1% 的碘液, 充分振荡, 观察颜色变化。将上述溶液加入 1 滴 1% 的碘液, 充分振荡, 观察颜色变化。将上述溶液加入 1 滴 1% 的碘液, 充分振荡, 观察颜色变化。

I. List of Retail Products and Proposed Products With New Eye Toxicology Data

F-7627	Turf Builder 26-3-3
F-7888	Improved Turf Builder(N) 27-3-3
F-7888	Turf Builder W 27-3-3
F-7673	Turf Builder(S) (FAS)
F-9025	Turf Builder S (FeSO ₄ ·7H ₂ O)
F-8509	Turf Builder Polyform
F-8100	Turf Builder(E)
F-8428	Lawn Pro Super Turf Builder N(HD)
F-7787	Lawn Pro Super Turf Builder W
F-8500	Lawn Pro Super Turf Builder I(HD)
F-8500	Lawn Pro Super Turf Builder(S) (HD)
F-5314	Starter Fertilizer
F-8785	Bermudagrass Fertilizer
F-7529	Turf Builder Plus Halts
F-8286	Improved Turf Builder Plus Halts(N) 7.5 lb/A
F-8297	Improved Turf Builder Plus Halts I 7.5 lb/A
F-8649	Improved Turf Builder Plus Halts W/S 7.5 lb/A
F-7530	Turf Builder Plus 2
F-7988	Improved Turf Builder Plus 2
F-7921	New Bonus S
F-7384	Turf Builder Plus Moss Control
F-8429	Summer Insect Control Plus Fertilizer
F-1813	Lawn Weed Control
F-6447	Grow Flowers
F-5437	Grow Shrubs and Trees
F-6018	Grow Acid Loving Plants
F-5314	Grow Transplants
F-5314	Vegetable Garden Fertilizer
F-7905	Spoon Fed Care
F-7381	Lawn Moss Control With Fertilizer
F-3586	Halts

II. Retail - Present Products With No New Eye Toxicology Data

F-6151	Turf Builder With Halts(Dacthal)
F-6949	Super Turf Builder Plus Halts
F-6928	Crabgrass Preventer and Dandelion Control & Fertilizer
F-5419	Starter Fertilizer With Crabgrass Preventer
F-6976	Super Halts Plus
F-7679	Turf Builder Plus 2 for Iron Deficient Soils - I
F-7645	Turf Builder Plus 2 for Grass W/S
F-7054	Lawn Pro Super Turf Builder Plus 2(N)
F-7645	Lawn Pro STB +2 For Iron Deficient Soil (I)
F-6713	Lawn Pro STB+2 For Grass W/S
F-6789	Bonus D
F-6669	Super Bonus For Dichondra
F-6927	Turf Builder Plus Lawn Disease Preventer
F-6457	Lawn Insect Control Plus Fertilizer
F-6617	Western Lawn Insect Control Plus Fertilizer
F-6617	Chinch Bug Control Plus Fertilizer
F-6459	Lawn Insect Control
F-4805	Western Lawn Insect Control/Kwit
F-6563	Summer Crabgrass Control
F-5263	Lawn Disease Preventer
F-7718	Spot Dandelion Control
F-7717	Spot Grass and Weed Control

III. ProTurf Present Products With No New Eye Toxicology

F-8500	HD Fertilizer Plus Iron
F-8426	HD Nitrogen Fertilizer
F-8160	New HD Nitrogen Plus
F-5410	Fairway Fertilizer
F-8506	HD Fairway Fertilizer
F-5749	Super Fairway Fertilizer
F-8427	HD Super Fairway Fertilizer
F-8423	HD Greens Fertilizer
F-8404	HD Nitrogen/Potassium Fertilizer
F-5437	Fertilizer With Minors
F-6619	HD Starter
F-8403	Improved Iron S
	Agrisul Sulfur
F-7507	HD Fertilizer With Weed Grass Preventer
F-6560	Fertilizer Plus Dicot Weed Control II
F-2450	California Fertilizer Plus Fungicide
F-7212	Fertilizer Plus 101BS Fungicide
F-3474	FF - II
F-4358	Fertilizer + Fungicide
F-8425	HD Fertilizer Plus DSB Fungicide
F-6617	Fertilizer Plus Insecticide III
F-6474	Weedgrass Preventer
F-6722	KOG Weed Control
F-96	Broad Spectrum Fungicide
F-6472	101 Broad Spectrum Fungicide
F-6385	Systemic Fungicide
F-5441	Fungicide III
F-6481	Fingicide II
F-6459	Insecticide One
F-6987	Insecticide III
F-7719	Nematocide/Insecticide
F-6479	Selective Poa Annua Control
F-6617	Fertilizer Plus Insecticide III
F-6457	Lawn Insect Control Plus Fertilizer
F-7291	Fertilizer and Crabgrass Preventer
F-8079	ProGrow Container Fertilizer
F-8807	ProGrow Premix Fertilizer Plus Minors
F-8134	ProGrow Container Fertilizer(HD)
F-7838	ProGrow Ornamental Herbicide I
F-8205	ProGrow Container Fertilizer Plus

IV. Formulations With Caution III EPA Label

F-8803	House Plant Insecticide(Not a granular)
F-9295	Turf Kleen(Not a granular)
F-8070	ProTurf Fertilizer Plus DSB Fungicide(TD-1771)
F-7529	Present Turf Builder Plus Halts 10 lbs/Acre Active - Non Free Urea Base
F-8301	Ornamental Herbicide Proposed Backup Formula - Ronstar 4 lbs/A on Polyform HD 10 lbs 4/M
F-8324	Turf Builder Plus 2, W/S Backup with MCPP/MCPA Plus Fe on Turf Builder at 1.25 N/M

V. Formulations with Danger EPA Category I Status

F-8455	Turf Builder Plus 2 (I) Polyform Backup MCPP/MCPA
F-9349	Improved Turf Builder Plus 2 Backup MCPP/MCPA (Varying Rate of 1 & 6).
F-9350	Improved Turf Builder Plus 2 Backup MCPP/MCPA (Varying Rate of 1 & 6).
F-7384	Turf Builder Plus Moss Control (PCP)
F-7893	Improved Turf Builder Plus Halts W/S 10 lbs/A Active
F-8649	Improved Turf Builder Plus Halts W/S 75 lbs/A Active (1 of 3 samples).
F-8456	Turf Builder Plus 2 (I) Polyform Backup MCPP/MCPA
F-8743	Ornamental Herbicide (Value Added) Ronstar/Surflan Backup
F-8208	Vegetable Garden Insecticide (Biatrol Plus)

APPENDIX II

ASBESTOS SAMPLING RESULTS

ASBESTOS ANALYSIS/BULK SAMPLES

<u>Date</u>	<u>No. Samples</u>	<u>Description and Laboratory</u>	<u>Results</u>
Feb. 1976	10	Grace-Libby 2 raw ore, 2 expanded, 2 sand. African 2 raw ore, 1 expanded, 1 sand. Turf Builder product-1.	Clayton results questionable. Gulf - detected Chrysotile in African ore and sand. - detected Tremolite in African ore and Grace ore.
July 1976	4	Grace-Libby number 2,3, and 4 raw ore and Virginia vermiculite ore.	Gulf - detected tremolite in all three Grace ores and no asbestos detected in Virginia sample.
April 1977	1	African ore	Clayton - detected chrysotile(2%), crocidolite(5%), and tremolite(1%).
April 1977	2	African Ore	McCrone - African ore - Doubtful presence of an amphibole in the tremolite - actinolite sieves, and unable to detect chrysotile by x-ray diffraction. Light microscopy analysis did not confirm presence of amphibole but did show traces of chrysotile.
		Virginia ore	- Virginia ore - by x-ray diffraction detected approximately 10% Tremolite-actinolite. Light microscopy showed a portion of the amphibole, equivalent to approximately 3 to 5% of the total sample to be asbestiform.

<u>Date</u>	<u>No. Samples</u>	<u>Description and Laboratory</u>	<u>Results</u>
May 1977	3	Turf Builder, Turf Builder plus 2, corn cobs.	McCrone - No asbestos detected.
Dec. 1977	14	South Carolina ore -3 Libby ore -3 African ore -3 Expanded vermiculite -3 Turf Builder plus 2 -1 Turf Builder -1	McCrone - By x-ray diffraction - no asbestos detected.
Sept. 1978	2	Virginia ore -1 expanded -1	McCrone - By light microscopy no asbestos detected
Oct. 1978	17	Grace-Libby ore - South Carolina ore - South African ore	McCrone - Samples prepared using Grace preparation scheme. X-ray diffraction indicated presence of asbestos in fines(-70M) of all three sources of ore and the heavy fraction from flotation of African. Tremolite in Grace ore Chrysotile in South African. By light microscopy no asbestos detected in South African samples but a massive form of actinolite confirmed in South Carolina samples(0.063%) and an asbestiform of actinolite confirmed in Libby samples(0.051%).
Jan. 1979	4	Virginia vermiculite ore	McCrone - a massive form of actinolite asbestos detected at 0.421%. Samples prepared using Grace preparation scheme.

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

| <u>Date</u> | <u>No. Samples</u> | <u>Description and Laboratory</u> | <u>Results</u> |
|-------------|--------------------|---|---|
| May 1979 | 15 | a) Libby BN452316 5/11/79 | Trace Tremolite - actinolite in -100M fraction |
| | | b) African 5/14/79 | No asbestiform materials detected. |
| | | c) Virginia B0603970 4/12/79 | Tremolite - actinolite(massive form) at 1% level in -100M fraction, trace level in -70+100M fraction. Would be 0.035% asbestos based on bulk ore. |
| | | d) African Sand(~90%) | Trace Tremolite-actinolite in -100M fraction. Could be contaminated. |
| June 1979 | 11 | a) Virginia C0602341(C-12)
B0603970(C-6) | No asbestiform material detected. |
| | | b) Virginia Sand(~100%) | No asbestiform Material detected. |
| July 1979 | 3 | Libby Sand(~95%) | No asbestiform material detected. |
| | 9 | Virginia WM602419(6/25/79)
B0603970(6/29/79)
B0603825(7/2/79) | Tremolite-actinolite in -100M and -70+100M fraction - (0.1%) of first two cars. with a trace in -100M of third car. Bulk analysis would be 0.0075 and 0.0064% asbestos. |
| August 1979 | 1 | TB-Virginia Vermiculite Production Period | No Asbestiform Material Detected |

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APPENDIX III

ASBESTOS MONITORING - PROPOSED PROTOCOL

ASBESTOS MONITORING
AIR, VERMICULITE ORE, PRODUCT

By: Gary Smith
Dick Gruenbaum
Al Davidson

I. VERMICULITE ORE & FINAL PRODUCT MONITORING

A. Test species, source & sampling site

1. Vermiculite

- a. African ore - Portsmouth
- b. Virginia ore - Charlottesville*
- c. Libby ore - Marysville

* Sample at source until Marysville sampling is tested.

2. Final Product

Turf Builder - Marysville

B. Test Frequency and costs

1. First Year - Six Times
(establish working base lines)

| | |
|----------|----------|
| February | August |
| April | October |
| June | December |

Cost-\$6,800 plus 120 man hours per year. An additional cost of \$1,500 plus 18 man hours would be needed to test Marysville as the sampling source for Virginia ore.

2. Following years - Four times

| | |
|-------|-----------|
| March | September |
| June | December |

Cost-\$3,600 plus 60 man hours per year.
(cost based on 1979 pricing)

C. Responsibility

- 1. Sampling - Quality Assurance
- 2. Sample preparation + Analysis - Analytical Research

D. Procedures(see attached)

II. AIR MONITORING

A. Marysville Production Area Monitoring - Trionized Plant

- 1. Vermiculite Unloading Area
- 2. Expander Operations Area

3. Control Process Area
4. Packaging Area
5. Warehouse Area
6. Dryer Area
7. Screening & Milling Area
8. Feeder Area
9. Resin Area

B. Test Frequency & Costs

The working baseline information has been established for the Trionized Plant so the following represents a maintenance audit.

Three test periods a year - Vermiculite unloading & expander operation areas are tested, on each test period. The remaining areas are tested on at least one of these periods.

February

May

October

Cost-\$1,000-\$2,000 plus 96 man hours per year.
(Cost based on 1979 pricing)

C. Responsibility

Safety & Environmental Protection

D. Procedures(see attached)

VERMICULITE ORE SAMPLING

1. Vermiculite Ore

- Trucks - Obtain a 1/2 cubic foot sample with a shovel from the top of the truck.
- Railcars - Obtain a 1/2 to 1 cubic foot sample with a shovel from one bottom section of car during unloading. For new suppliers obtain one sample from each section.
- Warehouse- Obtain a 1 cubic foot sample with a shovel from several different locations on the storage pile.

2. All samples are to be split down to appropriate size in the QA laboratory using a 1:1 splitter.

TREMOLITE ANALYSIS OF #4 and #5 ORE COMPOSITE

