

Ohio Pedologist Newsletter
Vol. 5, No. 1 - April 1979

George Hall - Editor

Can this really be the fifth year for the Newsletter? Time flies so rapidly that this issue got a delayed start. It is encouraging to see the renewal of memberships coming in. The number of members living out of state indicates that even after leaving Ohio, Pedologists want to know what they are missing out on. We will continue to encourage the non-Ohioans to keep in touch and the Newsletter will publish their comments until we have so much news from Ohio Pedologists that we don't have space.

Summer Picnic

Joe and Bob have opened the Wyandot Indian Territory for the Annual Summer Picnic. Wagon trains will roll into the Upper Sandusky City Park just before noon on Saturday, July 21. Information on trail routes, tepee accommodations, bluegrass prairie adventures and the big pow wow will come later.

Annual Winter Meeting

The annual meeting on January 16 was preceeded by a luncheon at the Hilton Inn. Following lunch Joe Evans, Unit Manager of the Ohio Department of Environmental Health discussed the use of soil information in their departmental decision making.

The election of AOP officers and Executive Committees resulted in the following leaders for 1979: Dwain Waters - President, Jim Bauder - President Elect, Marvin Bureau - Past President, Bob Parkinson - Secretary-Treasurer, George Hall - Editor, Mike Plunkett - Federal Agencies Rep., Tim Gerber - State Agencies Rep., Neil Smeck - Academic Institution Rep., Paul Reese - Private Practice Representative.

Following the election George Shafer and Garth Volk were presented with Honorary Membership certificates.

Executive Council Meeting
(excerpts from the minutes)

Tuscarawas County Office Building
New Philadelphia, Ohio
Feb. 24, 1979

A discussion was held on AOP funds and their use. It was felt that AOP should decide whether or not to apply for non-taxable status. The Sec-Treas. will contact Jon Gerken to get his ideas. Jim Bauder will contact NOGS to learn about their financial status. There was a discussion on the use of funds to distribute information to members in the form of publications or tapes of speeches, seminars, etc. It was decided to print abstracts of relevant papers in the AOP newsletter and include the author's address so that reprints could be obtained. It was estimated that expenses are about half of the total intake for the year. It was decided that Dwain Waters, Bob Parkinson and Jon Gerken should get together on finances.

-2-

There was a general discussion on AOP membership. The Association needs to maintain and increase its current membership rolls. One possible means of increasing membership is through encouraging out-of-state membership. It was suggested Norris Williams investigate out-of-state membership relative to the membership categories defined in the AOP Constitution. Norris should report his findings to the members at the summer meeting. It was suggested Norris also recruit former Ohio pedologists into AOP.

The Treasurer's Report was given showing a balance to date of \$2080.77.

Applications for Affiliate status were accepted for Mark Feusner, George Derringer and Rick Robbins.

It was decided to continue the Best Newsletter Article of the Year competition; \$10 will be the cash prize.

Respectfully submitted,

Bob Parkinson

A Note from your President

Well we've had our winter and all of us do hope for an early Spring. I enjoy this time of year as much as any of you...I usually have a sore pitching arm and the old coach has to sit on the side and give the kids the ball. I truly enjoy being out enjoying the astonishing progression of changes taking place.

What is happening to our profession? In the February executive council meeting much discussion dwelt on how we should serve the membership. This newsletter, put together by our able Editor Dr. George, shall continue to be our voice. I ask each of you to submit an article, or articles, possibly good enough for the First Place Prize. The newsletter will continue to keep us informed of information, or literature and begin listing title and author of pertinent research articles. Each of you is asked to suggest the addition of articles which you have read and think the other members may find interesting. The suggested articles will be listed and those of the membership can request a copy from the author.

The council talked about the possible use of funds from the treasury to purchase books, to be circulated among the members. Is this how a part of our annual income (your dues) should be used? Write to me if you have a suggestion as to how a part of our income can be used (With taxes as they are we could all use a refund).

A "Hello" to our out-of-state members from the mighty Tuscarawas Valley. Thanks for continuing your support to the Association and let us know if your associates wish to become members. As time goes by our organization becomes a bit more regional. I wonder who is going to swim the Ohio next?

Let's remember our Summer picnic scheduled for Saturday July 21 at Upper Sandusky.

See you all in July,

Dwain

NEWS FROM SCS STATE OFFICE

The Williams County Soil Survey has been published and received. This makes 36 modern, detailed soil surveys. The official release meetings are being planned. Copies will be mailed to offices after the official release meeting. Lake County should be published in a month or so.

Recent training at the Midwest Technical Service Center in Lincoln has included:

Larry Tornes	Laboratory Data - Uses
Rex Mapes	Laboratory Data - Uses
Bob Hendershot	Soil correlation school
Ron Scherzinger	Soil correlation school
Dan Lemaster	Soil correlation school
Ken Stone	Soil correlation school

Congratulations go out to the Hendershots, Gerkens, and Plunketts for recent (December - February) additions to their families. Two girls and a boy. Could these be future soil scientists? (Note the time of year. Who said developing APO's didn't pay off? Just another good example of planning to avoid loss of field time. Good work men!)

FROM THE DLS OFFICE

Several personnel changes have occurred in the Division since the beginning of 1979. Forrest Cunningham, party leader at Marion, resigned in January to accept employment with Na-Churs Fertilizer Company at Marion as a soil scientist.

Terry Priest, who was also headquartered at Marion, resigned in late February to accept employment with Excello Corporation at Lima.

Ed Miller at Portsmouth has been promoted to the party leader at Marion where he will begin work April 8, 1979.

Richard Buzard, a Kent State graduate, has been employed as a Soil Resource Specialist and begins work in Carroll County on March 26, 1979.

Linn Roth in Tuscarawas County has been promoted to a higher level Soil Resource Specialist and will continue to work on the Tuscarawas survey.

The Division Chief is presently interviewing for Soil Resource Specialist positions in Scioto, Athens and Marion Counties. A good selection of applicants is available and it is hoped all positions will be filled by June 1.

The Division published and released the Soil Inventory Progress Report for Cuyahoga County. The report for Seneca County is expected by April 1 and the report for Belmont by May 1.

Other reports being readied include Madison, Auglaize and Geauga Counties.

The Division in cooperation with SCS and OCAP are preparing an Important Farm Land Map for Montgomery County and have several others scheduled.

Soil Inventory Board

Interest from counties in which surveys have not been completed or are not in progress continues at a high level.

Board members attended a meeting in Morrow County to discuss soil survey possibilities and have meetings scheduled with County Commissioners and other interested groups in Jefferson and Adams Counties. A letter has been received from Harrison County expressing their interest and asking the Board to meet with them.

OSU Ivy Towers

During the Spring quarter break Neil Smeck, George Hall and Jerry Bigham along with 12 students spent 6 days studying the soils and agriculture in eastern and northern Arkansas. The trip was set up by Dr. Moye Rutledge of the University of Arkansas and a former student at OSU. The highlight of the trip seemed to be a study of the 40-60 ft loess cuts at Forest City. Lyle Jones, now a graduate student at UA, spent a day explaining the soils around Fayetteville.

Communications with Nick Holowaychuk suggest he is still going strong. After his mapping in the Canadian Rockies last fall he took on the job of investigating the effect of sulfur on the soils of Alberta. He seems to be thriving on his retirement.

Bids are in on the proposed Agronomy, Natural Resources and Plant Pathology Building. The bids were higher than estimated so a few cuts are being made before start of the building. Ground breaking is still expected to take place this spring.

Notes of Members, Former Members and Friends

Larry Milliron is keeping us up to date on his activities. Larry is in Cedar County, Nebraska. Following is a portion of a letter to Bob Parkinson.

"This winter has been quite a contrast to last. The driving snows haven't caused me to miss getting to the office yet this year - last year I missed several days several times. Though it's plenty cold it's not been quite as severe as last winter. This winter the snow blanketed the ground pretty uniformly in contrast to last winter so that probably the frost line will not get to the 5 or 6 foot depths as it did last year.

I finally found a "good" arrowhead in Cedar County. It was about an inch and a half long purplish-brown and medium quality flint. That, two thumb scrapers, and a piece of another arrowhead is the total artifact find for this county. I have enjoyed gleaning gravel pits in the county for fossilized bones, knuckles, and teeth and some small petrified wood fragments. Eric has found the largest tooth so far - about 4 inches long and somewhat rectangular with a flat top - like a hippopotamous tusk. I really haven't tried snagging yet but this past month has been a bonanza for those that do. The area engineering tech's son caught (snagged) a unique paddle fish that was about 97" long and 93 pounds (or reverse figures). It is costing over \$300 to mount it. These fish are related to the shark family (no bones but cartilage skeleton) and have a paddle snout or a extended broad upper "lip". They are found only in the Missouri River and in China(?) or Asia someplace. They don't take bait so weighted (8 oz) treble hooks are cast across the channel and retrieved in hopes of snagging these fish. They are said to be tasty but have a layer of fat under the skin and a dark (?) along the backbone (or whatever) that has to be carefully and immediately removed in order to not taint the meat".

A Larry Milliron comment on mapping (in Nebraska, of course)

"The other day in the office Jack was sitting at his desk flipping a coin and writing something on his map. The party leader asked him what he was doing. Jack said he was making his final decisions on some questionable areas on his map. A short time later the party leader saw Mike doing the same thing and felt obliged to inquire what he was doing. "Well, Mike said, I have to do some joining and I'm checking Jack's map".

John W. Lawrence's address
73 Wyoming Dr.
Huntington Station
Long Island, New York 11746

Tuscarawas County Soil Survey - Linn Roth

The soil survey of Tuscarawas County is now over half completed. The crew, Dwain Waters, Linn Roth, and Mark Feusner, have been busy this past winter putting the finishing touches on completed atlas sheets, counting map unit acres, and writing map units for the Descriptive Legend.

So far we have completed mapping in 9 townships. These townships are in the western and northern part of the county. Major soil series in the county include Coshocton, Guernsey, Westmoreland, Hazleton, Fitchville, Glenford and Chili.

Executive Committee

Dwain Waters - President
Gibbs Land
Dover, Ohio 44622
216-364-2783
office 364-8811 (ext. 271)

Tim Gerber - State Agencies
4062 Thompson St., N. W.
Carrollton, Ohio 44615
216-735-2603
office 216-627-5913

Marvin Bureau - Past President
241 Ihrig Avenue
Wooster, Ohio 44691
216-264-5861
office 216-264-1021 (ext. 191)

Paul Reese - Private Practice
240 Glendola St., N. W.
Warren, Ohio 44483
216-847-8552

Jim Bauder - President Elect
3095 Bernewood Drive, NW
Canton, Ohio 44709
216-492-0715
office 216-454-5651 (ext. 246, 247)

Neil Smeck - Academic Int.
Rt. 2, Basil Western Road
Baltimore, Ohio 43105
614-862-8778
office 614-422-2247

Bob Parkinson, Secretary-Treasurer
200 Coshocton Avenue
Mt. Vernon, Ohio 43050
614-392-6455
office 614-522-4962

Mike Plunkett - Federal Agencies
120 South Market Street
Waverly, Ohio 45690
office 614-947-7458

George Hall - Editor
1113 Kennington Avenue
Columbus, Ohio 43220
614-457-2726
office 614-422-2001

Soil Survey Horizons

For those of you who receive Soil Survey Horizons through AOP; the Winter 1978 issue has not arrived. The ASA printing is running behind schedule and the Jan.-Feb. issue of SSSAJ is not out yet either.

Abstracts

In this issue are abstracts of articles from Soil Science Society of America Journal and Soil Science for 1978. The articles were selected to make the members aware of some of the ideas that are currently bouncing around in the profession. Most authors are only too happy to send out reprints so if you find an article that is interesting don't hesitate to write the first author on a paper and request a copy. There should be enough information in the footnotes to get an address. D. Norton is now a technician in the Agronomy Dept. at OSU. If this approach is considered useful by the membership, it will be continued. Any comments or suggestions on information dissemination through the Newsletter will be appreciated.

"If you've been doing something the same way for the last five years, you're probably doing it wrong". Ben Franklin

in Southwestern Indiana¹

L. D. NORTON AND D. P. FRANZMEIER²

ABSTRACT

Soil properties are related to stratigraphy of parent materials and to hillslope position in southwestern Indiana where the landscape consists of gently rolling hillslopes and nearly level plains. Loess was uniform thickness downslope. Two distinct units were recognized. The upper (Peoria) loess contained about 15% less sand and had greater calcium carbonate equivalent, greater field water content, and lesser bulk density than the lower (sandy) loess. The Sangamon paleosol below the loess consisted of an upper slightly developed horizon and lower well developed horizons. The percentages of some heavy minerals were similar in the two loess units and similar in the two paleosol units, but differed between the loess and the paleosols. The lower loess showed slight soil formation. A fragipan was present only on summit and shoulder positions where the paleosol formed in weathered sandstone and shale, but not where it formed in outwash. Apparently there was slight soil formation in the lower loess before its surface was covered by the upper loess. Our data support the hypothesis that fragipans form in loess underlain by less permeable materials at certain depths and that silica (or silicate) acts as a bonding agent in fragipans. We believe that the fragipan forms by processes associated with the modern landscape, but its formation is influenced by pre-Peoria soils or weathering zones.

Additional Index Words: fragipan, Sangamon paleosol.

Norton, L. D., and D. P. Franzmeier. 1978. Toposequences of loess-derived soils in southwestern Indiana. *Soil Sci. Soc. Am. J.* 42:622-627.

¹Contribution from the Agronomy Department, Purdue Univ. Agric. Exp. Stn., West Lafayette, IN 47907. Journal paper no. 6891. Received 14 Nov. 1977. Approved 3 Mar 1978.

²Former Graduate Assistant, currently Research Associate, Ohio State Univ., Columbus, Ohio; and Professor, respectively.

A Century of Soil Development in Spoil Derived from Loess in Iowa¹

GEORGE R. HALLBERG, NYLE C. WOLLENHAUPT, AND GERALD A. MILLER²

ABSTRACT

During the past century well-drained soils have formed in leached loess spoil materials under prairie vegetation along railroad cuts in Iowa. The spoil material was deposited on an existing Tama Variant soil which reveals the effects of 100 years of burial.

In 100 years' time a 31-cm A horizon has developed in the spoil, available phosphorus recycling has been measured, and the translocation and accumulation of illuvial clay and fine silt has occurred. The organic carbon content reached a maximum of 2.6% and exceeds 0.58% to depths of 40 to 46 cm. This 100-year-old A horizon, however, does not meet the color criterion for a mollic epipedon. Organic carbon content seems to build up rapidly in the first 30 to 50 years of soil development. After this time a slower more steady-state rate of increase seems to take place.

In 100 years' time the buried soil shows a 1% decrease (from 2.6 to 1.6%) in organic carbon in the upper 20 cm. Most of this difference resulted from the degradation of fibrous organic matter after burial. Accompanying this loss of organic matter is an increase in bulk density, which has impeded soil water movement. This density contrast has enhanced the accumulation of illuvial clay and fine silts in both the lower portion of the 100-year-old soil and in the buried A horizon.

Additional Index Words: mollisol, mollic epipedon, natensol.

¹Journal Paper no. J-8872 of the Iowa Agric. & Home Econ. Exp. Stn., Ames, Iowa 50011 Project no. 2100. Contribution from the Dep. of Agronomy and the Iowa Cooperative Soil Survey. Received 5 July 1977. Approved 2 Nov. 1977.

²Chief, Res. Div., Iowa Geological Survey, Iowa City; formerly Research Associate, Dep. of Agronomy, Iowa State Univ., and now Research Geologist, Iowa Geological Survey, Iowa City; and Associate Professor, Dep. of Agronomy, Iowa State Univ., Ames, Iowa.

A Soil Moisture Budget Model Accounting

for Shallow Water Table Influences¹

R. G. STUFF AND R. F. DALE²

ABSTRACT

Soil moisture balance programs developed on well-drained soils were found to be unsatisfactory for a soil underlain by shallow water tables, a condition typical of about 9 million acres of cropland in Indiana. Capillary rise past a 105-cm root zone boundary was estimated as the difference between estimated evapotranspiration (ET) and changes in soil moisture under corn (*Zea mays* L.) on a tile-drained Typic Argiaquoll at West Lafayette, Ind. during three growing seasons, 1971-1973. Capillary water was found to supply an average of 27% of the ET in periods with little or no precipitation. Computer model estimates showed capillary water to furnish about 17% of the total ET over a 100-day period from 49 days before silking to 50 days after.

Evapotranspiration was based on measured pan evaporation adjusted with crop development and moisture stress factors from the literature. Soil moisture in the root zone was measured by neutron counting and expressed as deficits from a variable holding capacity which was allowed to change in time depending upon the depth of the shallow water table. Water table levels were measured in open wells, and water table changes were statistically related to the estimated amounts of capillary rise for use in the model. The factors used to estimate capillary rise were the soil moisture deficit in the root zone and depth of the water table.

The derived relationships with those obtained from literature sources and assumptions regarding runoff and recharge were programmed in a computer model for simulating the daily moisture status and changes in the corn root zone. Model inputs were pan evaporation, precipitation, soil moisture characteristics, corn silking date, and initial soil moisture conditions. The model was found to closely track measurements of both soil moisture and water table depths in four independent seasons: early and late plantings in 1970 and 1974.

¹Contribution from the Dept. of Agronomy, Purdue Univ. Agric. Expt. Stn. (Journal paper no. 6916), West Lafayette, IN 47907. Partially supported by National Science Foundation Atmospheric Sciences Section Grant ATM 75-10001 AO1 and U.S. Dept. of Commerce NOAA EDS Grant NG-44-72. Received 14 Oct. 1977. Approved 26 Apr. 1978.

²Agronomist, Natl. Aeronautics & Space Admin., Houston Tex., and Assoc. Prof., Agronomy Dept., Purdue Univ., W. Lafayette, IN. 47907.

Mottling in Soil Profiles Containing a Coarse-textured Horizon¹

B. E. CLOTHIER, J. A. POLLOK, AND D. R. SCOTTER²

ABSTRACT

Mottling often characteristically occurs in fine-textured soil just above an underlying coarse-textured layer. Interpretation of such mottling as representing a normal drainage impedance is misleading as a perched or ground water table may never occur in the profile. In this paper a simple soil water drainage model is discussed that aids interpretation of the pattern of mottling in a soil horizon above a coarse-textured layer. Also the influence of various soil physical parameters on mottling phenomena is analyzed, suggesting that the more coarse-textured the underlay the greater the propensity to mottle. The tendency to mottle is shown to be greatest in the soil immediately above the coarse-textured layer. The model is applied to the naturally-layered Manawatu fine sandy loam, a Dystric Fluventic Eutrochrept.

Clothier, B. E., J. A. Pollok, and D. R. Scotter. 1978. Mottling in soil profiles containing a coarse-textured horizon. *Soil Sci. Soc. Am. J.* 42:761-763.

¹Contribution from Plant Physiology Div., DSIR, and Soil Science Dept., Massey Univ., Palmerston North, New Zealand. Received 23 Feb. 1978. Approved 5 May 1978.

²Scientist, Plant Physiology Division, DSIR, and Senior Lecturers, Soil Science Dept., Massey University, respectively.

SORPTION OF PESTICIDES BY MODEL SOILS AND AGRONOMIC SOILS: RATES AND EQUILIBRIA

KERMIT S. LAFLEUR

Department of Agronomy and Soils, Clemson University, Clemson, South Carolina 29631

SOIL SCIENCE Vol. 127, No. 2

ABSTRACT

Sorption of selected pesticides by selected model soils, model soil components, and agronomic soils has been assessed. Sorption by the model soil components gives insight into sorption by the composite substrates.

Pesticide adsorption ratios (= amount sorbed/amount applied) for inorganic substrates were independent of pesticide concentration. Adsorption ratios for substrates containing organic matter decreased with increasing pesticide concentration.

Pesticide sorption ratios for inorganic substrates were essentially independent of time: adsorption was wholly independent; desorption was marginally dependent in some cases. Pesticide sorption by substrates containing organic matter increased with time; equilibrium was not reached in 10⁴ min, but extrapolation suggested it was reached before 10⁵ min.

Sorption curves obtained for the agronomic soils are similar to, sometimes indistinguishable from, those obtained for peat-containing model soils.

Sorption values for composite soils can be calculated, approximately, from sorption values for their components. Calculation is based on apportioning a full share for the dominant component (e.g., peat), a full share of residual free pesticide for the intermediate component (e.g., kaolinite), and a full share of remaining free pesticide for the least reactive component (e.g., sand).

EFFECT OF SEPTIC TANK EFFLUENT ON THE BASE STATUS OF TWO TILE-DRAINED SOILS

R. B. RENEAU, JR., W. F. KITCHELL, AND C. D. PEACOCK, JR.¹

Department of Agronomy, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061

SOIL SCIENCE Vol. 127 No. 2

ABSTRACT

Changes in SAR (sodium adsorption ratio), pH, and EC (electrical conductivity) of shallow groundwaters as a result of disposal of septic tank effluents into wet-tile-drained soils (Typic and Aeric Ochraquults) were studied during 1974, 1975, and 1976. Changes in these constituents in groundwaters were monitored at selected distances from the drainfield (by placement of sampling wells in the direction of groundwater flow), in waters intercepted by the agricultural tile, and control wells. Sodium adsorption ratio, pH, and EC generally decreased with increasing distance from the disposal area. The SAR decreased from 20 to 25 in samples adjacent to the drainfield to <2 in the control wells. The SAR in the drinking water supply was 40.

Soil samples were collected to the 160-cm depth at distances corresponding to the location of water-table wells. Changes in ESP (exchangeable sodium percentage), BS (base saturation), and pH occurred in both the Typic and Aeric Ochraquults and reflected changes detected in groundwater samples. Increased ESP, BS, and pH were observed adjacent to the disposal area in the argillic horizons when compared to the surface horizons. Values for these constituents in the argillic horizon decreased with increased sampling distance from the disposal area. In the control profile, their distribution was reversed, the surface horizon normally having increased ESP, BS, and pH compared to the subsurface horizons. The magnitude of the differences between the drainfield and the control areas was exemplified by the 350 µg/ml extractable Na in the argillic horizon adjacent to the drainfield, as compared to less than 10 µg/ml present in the control profile for the Typic Ochraquult.

THE PREDICTION OF MEAN MONTHLY SOIL TEMPERATURE FROM MEAN MONTHLY AIR TEMPERATURE

SOIL SCIENCE Vol. 126, No. 3

TERRENCE J. TOY, ANDREW J. KUHAIDA, JR., AND BRIAN E. MUNSON

¹Department of Geography, University of Denver, Denver, Colorado 80208

ABSTRACT

Though soil temperature is important to a variety of earth science subdisciplines, data are collected at few locations. This report presents simple, linear models for estimating mean annual, seasonal, and monthly soil temperatures with reasonable accuracy, using only air temperature data. A general equation based on all months and all sample stations taken together, seasonal equations, and equations for individual stations are provided. These models can be used to estimate soil temperature from air temperature data collected by the National Weather Service at stations throughout the United States.