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To advance the science and art of good land use

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Cover: Technology, such as irrigation, overcomes the vagaries of weather and climate only to a point. See page 350. Photo courtesy Valmont Industries, Inc., Valley, Nebraska.

The Soil Conservation Society of America is dedicated to promoting the science and art of good land use, with emphasis on conservation of soil, water, air, and related natural resources, including all forms of beneficial plant and animal life. To this end, SCSA seeks through the *Journal of Soil and Water Conservation* and other programs to educate people so that mankind can use and enjoy these natural resources forever.

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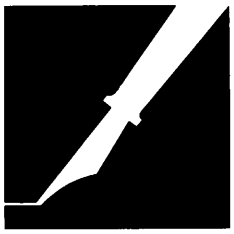

PEN POINTS

Better and better!

The September-October 1984 *JSWC* surely must be one of your best. Each time a *JSWC* arrives I keep thinking that it cannot be better than the last. But so frequently I end up being fooled—it is getting better all the time.

Melville H. Cohee
Fitchburg, Wisconsin

It was with great interest that I read the entire September-October *JSWC*. I especially enjoyed the first four articles based on addresses by participants at SCSA's 39th annual meeting at Oklahoma City. These four articles gave me a good feel for the tone of the meeting and the topics discussed. Thanks for the miniproceedings for those of us who could not get to Oklahoma City.

Tim Dunne
Hackettstown, New Jersey

Merger a must

I agree with Robert Rodale [*JSWC*, September-October 1984, pp. 294-296] in that it is time to reinvent conservation as a part of the whole of agriculture and not as a separate portion.

Those with whom I work are looking for ways not only to control their erosion problems but to make long-term, cost-effective soil improvements that increase fertility, thus reducing the out-of-pocket inputs needed to produce crops. The symptomatic solutions to soil erosion will no longer suffice. They're looking for sustainability.

As professionals we are, however, sadly lacking the expertise that we are being called upon to provide. The information I use to service their needs does not come from within the agency nor our professional Society or *JSWC*.

It is time to lead the way for the merger of conservation and agriculture. I encourage SCSA to appoint a group to begin this effort.

Daniel M. Rosswurm
Booneville, Indiana

Rangeland revolutionary?

I respond to the interview with Allan Savory [*JSWC*, July-August 1984, pp. 235-240]. My training is in grassland science from the University of Natal, Pietermaritzburg, South Africa, where I currently hold the equivalent position of an associate professor. I am also a past-president and editor of the Grassland Society of Southern Africa.

South Africa probably has a higher proportion of stockmen practicing rotational grazing than any other country in the world. It also has a long history of rotational grazing on both the ranch and experiment station: there are about a dozen rotational grazing experiments that are 20 to 30 years old (and some more recent), while ranchers were practicing rotational grazing even before this. I, therefore, have experience and a good training in principles of rotational grazing, and wish to comment on certain issues relating to the *grazing management* part of "Holistic Resource Management." For convenience I will call this the Savory Grazing Method (SGM). Since Savory claims that this (SGM) is a thing of the past, I must emphasize that I refer to his *current* views.

For someone who has followed the history of SGM, it is obvious that it has changed substantially over the years. But why? Could it be that failures kept popping up? Savory says this only happened up to 1969. But then why did changes still take place after this? Would there have been fewer changes if Savory had been trained in range science?

The "exhaustive Charter trial" was mentioned in the interview. From a scientific standpoint, this "research," I am told, can only be regarded as the crudest of observations. In fact, the whole of SGM was probably developed from superficial observations which can be extremely misleading.

The Charter trial also raises the question of stocking rate. I have been informed by colleagues in Zimbabwe that the original trials are in a state of ruin as a result of drought. So there are lessons to be learned: overstocking *does* lead to disaster no matter how many fences you have, but the damage may take a number of years to show up.

In his question, "Please show me the research that links numbers (of animals) to overgrazing?", Savory implies that there is no such research. This is not true. There is research in South Africa that has clearly demonstrated that overstocking causes range degradation, even if you are practicing intensively managed rotational grazing.

The apparent disregard for the hazards of overstocking is the most dangerous aspect of SGM. It fails to recognize the most simple and basic principle of ecology: every biological ecosystem *must* have a ceiling/upper limit to production! In fact, there are many situations where overstocking under SGM is more hazardous than continuous grazing at moderate stocking rates. So to ranchers I must say that stocking rate is crucial, and no matter how many pastures you may have, the danger of overstocking and subsequent financial ruin always exists. To researchers I suggest we try to identify optimum stocking rates for different environments, range types, management procedures, etc.—the danger of overstocking is so fundamental it does not need to be researched.

The wagon-wheel fence design originally was adhered to rigidly in SGM. But it seems that this is not so much a necessity any more. Perhaps it is because the age-old principle of land division was finally discovered: fences must follow natural boundaries and confine uniform units of vegetation. This is necessary to avoid overgrazing of certain areas which will occur if "good" and "bad" rangeland is fenced into the same pasture. In its simplest form, this principle can be demonstrated with two adjacent fields of, say, alfalfa in one and wheatgrass in the other. The management requirements of the two are different and so, if each pasture included an area of both species, one would be overutilized. Fences should, therefore, *separate* species so each can be managed according to its requirements. The same applies to adjacent but different range types, or range in good and bad condition. The wagon-wheel design often violates this principle.

Talking of species, another flaw in SGM is the claim that you do not have to know the range species to apply it. This is utter nonsense! Range types and species vary widely in management requirements, and it is important to know plant responses to defoliation before designing management. This, at least, is the scientific approach, and I suggest SGM is the shotgun approach. For example, in many areas of South Africa most feed for livestock (mainly goats in

such areas) comes from shrubs and trees. These plants are extremely sensitive to continuous defoliation and require three to nine months to recover after utilization, compared to 30 to 60 days for most grassland types of range. When SGM was introduced into these areas, it was hopelessly unsuitable simply because this type of range had not been encountered before.

It is misconceptions, such as the emphasis of "hoof action" in range management, that contributed to SGM being discredited by the entire range profession in South Africa. And such misconceptions can only have arisen from lack of training in range science. Hoof action is only important in burying seed under certain deteriorated range conditions—its role in water and nutrient cycling and in *maintaining* range in good condition is negligible. With regard to these processes, plants probably have a much more important effect than animals. It would seem that SGM, therefore, does not adequately recognize one of the fundamentals of rotational grazing: control of plant competition.

Some of the best rangeland I know of in South Africa has not seen an animal or its hoof in 30 years; it has simply been mown for hay or occasionally burned. So the answer in such cases is not "herd effect" or "hoof action" but *periodic* and *uniform* defoliation, thus controlling plant competition. It is my belief that the most important function of rotational grazing in South Africa is to *maintain* range in good condition rather than to improve range in poor condition.

Range scientists were accused in the interview of not reading research literature, then Voisin's *Grassland Productivity* (1959) and Clements and Weaver (1938) were cited as inspirational texts for SGM. This is absurd! These texts can be regarded only as museum pieces, and people who cling to them are living in the past. Modern range scientists intent on making advancements read *current literature.*

While on qualifications, an interesting development in South Africa is the recent enactment of legislation requiring all who consult in the natural sciences to be registered with the Council for Natural Scientists.

Finally, I wish to focus on Mr. Savory's promotion strategy for his newly launched "Center for Holistic Resource Management." In the interview he stated that "modern range science is part of the (desertification) problem and not part of the solution." Also, his advice to young people interested in range management-related careers was "...do not get training in range management or wildlife management."

On the other hand, in the publicity for his new Center for Holistic Resource Management, he has placed great emphasis on the fact that the vice-president is an assistant professor in range science. And why? Does the range science profession add credibility to his center? Is Savory not flogging his cow and trying to milk her at the same time?

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Organic contaminants too

In the continuing debate over the value of sewage sludge as a soil amendment (e.g., *JSWC*, March-April 1984, pp. 82-83), it is generally assumed that the principal toxic elements involved are heavy metals. *JSWC* readers should be aware that organic contaminants can also pose problems.

Substances of concern include the organochlorine pesticides (e.g., dieldrin), polychlorinated biphenyls (PCBs), chlorinated phenolics, polyaromatic ring compounds (e.g., benzpyrenes), and others. Many of these substances or their breakdown products are toxic, carcinogenic, and teratogenic. Demonstrated sludge-related hazards include concentration of soil organic contaminants in plant tissue and direct ingestion of sludge by grazing animals, with subsequent concentration along food chains.

I believe the United States is the only country to have introduced a limit for organics in soil-applied sludge, but only for PCBs. It is difficult to set limits for other organics since little is known about their environmental behavior.

W.J.H. Ramsay
Land Capability Consultants Limited
Willingham, England

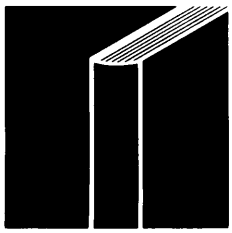
Fallow as a reference?

I was interested to read the interview with Walter H. Wischmeier in the March-April issue [pp. 105-107]. In the past few years, four sites have been set up in the Peach River Region of northeastern B.C. [British Columbia] and northwestern Alberta to, among other things, test, verify, and improve the universal soil loss equation for the Peace River Region. We have been operating one of these sites on the Northern Lights College farm in cooperation with Agriculture Canada.

One of my concerns has been the use of continuous fallow as a reference. The changes in soil structure over time that one might have predicted with continuous fallow (due to organic matter breakdown and soil pulverization) seem to be born out in our experience so far. Our plots had all been in hay for a number of years previously. One continuous fallow plot was started a couple of years before the other one. Runoff and soil erosion are regularly lower on the second plot, and the soil is visibly more porous. (The condition seems to have stabilized on a continuous fallow plot at the Beaverlodge Research Station near here, mainly because the continuous fallow plot has now eroded to subsoil!)

This dynamic nature of continuous fallow would seem to me to call into question its use as a reference.

Keith Carroll
Northern Lights College
Dawson Creek, B.C.



BOOKS, ETC.

The Federal Lands Revisited. By Marion Clawson. 302 pp., charts, tbls., index, 1983. Resources for the Future/Johns Hopkins University Press, Baltimore, Md. 21218. $25.00, hardbound; $8.95, paperback.

> In view of the intensity of use and rising economic value, which have increased the importance of the lands now federally owned; the increasing dissatisfaction with the present management of these lands, expressed by many user groups and others; and the emerging debate over their continued federal ownership, it is time to consider the major alternatives for the use of these lands in the future.
>
> An assumption basic is that methods of managing these lands, which differ from the methods presently employed by the agencies, will be seriously considered and perhaps adopted.

A quarter century after the classic book *The Federal Lands: Their Use and Management* by Marion Clawson and Burnell Held appeared, Clawson revisits that familiar terrain with new insights and new suggestons. The fundamental concern appears to be that the historic development of the principal federal land management agencies, the Forest Service and Bureau of Land Management, does not result in maximizing the outputs these resources could provide the U.S. economy.

Clawson first presents a brief historic overview of federal lands, their uses, general management, and planning. Next, he makes the "case" for permanent retention and public management of these lands, followed by the "case" for disposal of those lands that can be given over to private ownership and management. In effect, he summarizes the continuing debate over our public lands between those who believe in permanent public management and those who do not. (The book was written during James Watt's tenure as secretary of the interior, when attempts were made to accelerate land disposal by the federal government—the now largely defunct Asset Management Program.)

Clawson then develops five conceptual alternatives for management of these federal lands:

"1. All or most of the present federal lands could be retained in federal ownership, but strenuous efforts would have to be made to improve their management, including more concern for the costs and returns from such ownership and management.

"2. All, or a large part, of the present federal lands could be turned over to the states, free or on payment of some price, and the further management or disposal of the lands could be determined by the states.

"3. All, or a major part, of the present federal lands could be sold to private individuals, corporations, and groups or associations, under terms which would be established in the enabling legislation.

"4. All, or large parts, of the present federal land area could be transferred to public or mixed public-private corporations, to be managed as decided upon by those corporations, but according to terms of enabling legislation.

"5. Long-term leasing of federal lands could be greatly extended, not only for mineral leasing as at present, but also for other commercial uses and for conservation or preservation purposes as well."

In their 1957 book, Clawson and Held partially developed the fourth alternative, management by public or mixed public-private corporations. In this latest work, Clawson concentrates on the fifth alternative, large-scale, long-term leasing, which is the most innovative part of the book.

Clawson concludes with brief chapters on special problems of intermingled ownerships, public participation, and ideas on needed research.—*RICHARD E. SHANNON, School of Forestry, University of Montana, Missoula, 59812.*

Protecting Farmlands. Edited by Frederick R. Steiner and John E. Theilacker. 312 pp., illus., bibliog., index, 1984. AVI Publishing Co., Inc., 250 Post Road Northeast, Westport, Connecticut 06880. $32.50.

In "concentrating on various approaches to agricultural land retention," Steiner and Theilacker have drawn on two sources for their book—the proceedings of Washington State University's 1979 conference "Farm Land Preservation—The State of the Art," and *Farmland, Food and the Future*, published by SCSA, also in 1979. Thus, they have been able to draw on a broad array of professionals in assembling the material for *Protecting Farmland*. Unlike many edited compendiums, this one is clear, precise, and well organized, which, along with good illustrations, makes for easy and interesting reading.

The agricultural land retention measures presented give an excellent overview of the current state of the art. Moreover, the methods reported have possibilities for use in many locations as well as for use in protecting other prime resource lands. The reader may well be aware of some examples of farmland protection not touched upon by this book, but this is natural in such a diverse field. As well, the emphasis here is on regular methods and less so on other, perhaps less coercive means of preserving prime lands. Nevertheless, the book is an excellent reference document for protection methods.

The editors, in attempting to update the contents of previous documents, have met with some minor problems. In some instances, achievements since 1979 are not recognized despite a publication date of 1984. In the preface and chapter 21, for example, it is not noted that the Canadian Federal Government adopted a Federal Policy on Land Use in 1980 to protect prime resource lands, including prime agricultural land. This policy directs all federal government departments and agencies to consider the effects of their policies and programs on land use.

Despite minor inaccuracies, the book should appeal to and be a well-used reference for anyone interested in farmland protection issues—*L. C. MUNN, Lands Directorate, Environment Canada, Ottawa, Ontario K1A 0E7.*

Soils

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