

The Fertility of Central Oregon Irrigated Lands

By H. D. Scudder, Agronomist, Oregon Experiment Station.

On the Central Oregon irrigated lands the fertility question is of very great importance. Because of the large yield of irrigated crops, the plant foods are rapidly consumed. In addition, there is considerable danger of direct loss of plant foods from the soil leaching where excess water is applied. Again, the crops most commonly sold from irrigated lands in Oregon at the present time are alfalfa, clover hay, grain and potatoes. All of these crops when sold off the farm take away heavy consignments of plant foods. Referring to the table below, a striking comparison between the effect of marketing alfalfa or clover hay and butter or pork may be seen. The average market value of the crop per acre is compared with the actual market value of the chief fertility elements or plant foods [nitrogen (N), phosphorus (P) and potassium (K)] actually contained in the crops sold.

	— PER ACRE —		— PER FARM —	
	Market Value	Market Value	Market Value	Market Value
Alfalfa hay 2 tons at \$6	\$12.00	\$35.85	\$720.00	\$1424.00
Clover hay 2 tons at \$6	\$12.00	\$20.90	720.00	1236.00
Timothy hay, 3 tons at \$10	\$30.00	12.94	1200.00	517.90
Potatoes 5 T. (200 Bu.) at 50c.	100.00	12.60	4000.00	504.00
Pork, 1000 lbs., at 7 cents	70.00	3.87	2800.00	154.80
Butter, 2000 lbs., at 30 cents	60.00	.05	2400.00	20.00

Best to Feed Hay Crops.
The common practice of selling alfalfa or clover hay from the irrigated farm, it can be seen at once, is a ruinous one from the fertility standpoint. It is a rather startling fact, when one realizes it, that the farmer usually sells alfalfa hay at a price which is just one-half the actual market value of the fertility elements it contains. It is true that approximately one-half the nitrogen contained in this ton of hay is obtained by the plant from the atmosphere, hence \$15 worth of the fertility value of three tons of alfalfa has been manufactured by the plant itself from the air; but it is by means of this really wonderful factory that the farmer must maintain his nitrogen fertility in the land, and not use it to sell at half its value on the market. Where these crops instead are fed to cows and pigs, as may be seen, practically all their fertility is retained in the soil. The alfalfa and the clover is a raw product which the cow and the pig must convert into a finished form, leaving their valuable by-products for soil restoration. A good grade cow will produce about 300 pounds of butter fat per year, which is worth \$60; 7000 pounds of skim milk, which, when fed to pigs is worth about 50 cents per hundred, or \$35; and 14 tons of manure, which is worth at least \$37. As in the case of many industries, the by-products from the cow if utilized are worth more than the product itself. This is especially true on the irrigated lands, for here as on other Eastern Oregon soils the humus and nitrogen are deficient and of vital importance.

Heavy crops of alfalfa, clover, potatoes, and other irrigated crops, however, consume large amounts of potassium and phosphorus as well as nitrogen. On the coarse sandy soils of the Hermon region and the sandy loams of the Deschutes valley, neither potassium nor phosphorus is as abundant as is desirable. This is true to such an extent that these elements, particularly the potassium, must be replaced, and this may profitably be done by applications of commercial fertilizers. Applications of potash on potatoes as compared with gypsum or "land plaster" on alfalfa and clover, at Redmond in 1912, gave the following results:

Summary of Fertilizer Trials, Redmond, 1912.
Crop, potatoes, fertilizer treatment, none, yield, 147 bushels; Potatoes, fertilizer treatment, K2SO4, 160 lbs., yield, 235 bushels, gain 88 bushels, value of gain \$44.00; cost of fertilizer, \$4.00, profit over fertilizer cost, \$39.00; Clover, fertilizer treatment, none, 3.33 T., yield, 15.39, cost of fertilizer \$4.00, profit over fertilizer cost, \$11.39; Clover, fertilizer treatment, Gypsum, 60 pounds, yield 3.48 T., gain .25, value of gain \$2.25, cost of fertilizer \$4.45, profit over fertilizer cost, \$1.80; Alfalfa, fertilizer treatment, none, yield 3.00 T.; Alfalfa, fertilizer treatment, K2SO4, 160 pounds, yield 3.965 T., gain .96, value of gain \$8.68, cost of fertilizer \$4.00, profit over cost of fertilizer, \$4.68; Alfalfa, fertilizer treatment, Gypsum, 60 lbs., yield 3.41 T., gain .41, value of gain 3.69, cost of fertilizer .45, profit over fertilizer cost, \$3.24; Alfalfa, fertilizer treatment, KCl, 160 pounds, yield 3.27 T., gain .27, value of gain \$2.43, cost of fertilizer \$4.00, profit over fertilizer cost \$1.57; Same Alfalfa, fertilizer treatment, none; 1912, fertilizer treatment Potash 1912, yield 2.34 T., gain .59, value of gain \$6.21, cost of fertilizer, none, profit over fertilizer cost \$6.21.

Potatoes in the above paragraph are at 50 cents per bushel and alfalfa and clover hay at \$9 per ton.
While the results for only one year are available on the potatoes and clover, there is little doubt in the writer's mind that they would have given results the second year equally as good as did the alfalfa. Certainly these results are sufficient to indicate the possibility of increasing the profits by judicious use of commercial potassium fertilizers and at the same time increasing the soil content in this deficient element. Commercial applications of either potassium or phosphorus should not be made wholesale, however, without first determining the actual benefits on each individual farm by means of trial strips. A good trial application is 160 pounds of sulphate of potash per acre on one strip, preferably alfalfa, clover or potatoes, which are heavy potassium consumers, and another trial strip of 160 pounds per acre of superphosphate on such a crop as corn, roots, alfalfa or clover.

Potash and Land Plaster.
Of special interest in the Redmond trial noted is the comparison of sulphate of potash with land plaster. Land plaster is widely used on the Crook county irrigated lands and generally in excessive amounts, and this is a dangerous practice. It should be fully understood that land plaster is a stimulant and not in any way a plant food. Its effect is to make the potassium of the soil soluble or available for plant use—hence, applied to such crops as alfalfa or clover, which require large amounts of potassium, it gives a marked increase in yield, but this is obtained at the expense of the soil. On the other hand, where the actual potassium itself is applied as commercial fertilizer, it not only gives a larger increase in the crop, as is shown by the residual effects of the first year's application on the alfalfa the second year, but it enriches the soil in this important plant food. Further, where 200 pounds of land plaster per acre is used, there is little question that in sandy soils under irrigation, leaching and a direct loss of plant food is possible. The writer does not hesitate to recommend careful trials of commercial potassium fertilizers on potatoes and legumes, and a discontinuance of the use of land plaster.

Use of Manure Recommended.
Heavy applications of barn yard manures on these soils—10 to 20 tons per acre—will give wonderfully increased returns, particularly on such gross feeders as corn, mangels, rutabagas, rape, and the like.
On the irrigated lands where barn yard manure is not available in large quantities, green manures, which are even more effective in rapidly increasing the nitrogen and humus content, may be used with great profit and should take a regular place in the rotation.
Applications of commercial fertilizers should be made early in the spring after plowing, the fertilizers being applied broadcast with a grain drill, or the like, and then disked in. Where the land is already in crop the fertilizers named may be broadcast over the crop in April after the ground is thawed out and just before the growth starts. In the case of alfalfa, the application may be thoroughly disked in. In potato fields the application should be either broadcast as described or applied in the furrows by means of fertilizer attachment to the planter. Applications of manure are most effective if thoroughly disked in before being plowed under and this is true also of green manures, particularly where the application is heavy and likely to dry out the soil or stop capillary action or root growth where turned under without first being thoroughly incorporated with the surface soil. These sandy irrigated soils, common to Central Oregon, give a wonderful response, especially to applications of manures of any kind.

BEND DRUGGIST DESERVES PRAISE
The Patterson Drug Co. deserves praise from Bend people for introducing here the simple buckthorn bark and glycerine mixture known as Ador-lax. This simple German remedy first became famous by curing appendicitis and it has now been discovered that A SINGLE DOSE removes sour stomach, gas on the stomach and constipation INSTANTLY.—Adv.

A few hours at a nice classy, clean, up-to-date place especially prepared for gentlemen, will remove all worry and troubles. The Metropolitan.—Adv.

NOTICE FOR PUBLICATION.
Department of the Interior, U. S. Land Office at The Dalles, Oregon, December 19th, 1913.

Notice is hereby given that Effie M. Kopper, widow of Fred E. Kopper, deceased, of Prineville, Oregon, who, on December 24th, 1910, made homestead entry No. 07856, for SE 1/4 SW 1/4, S 1/4 SE 1/4, sec. 27, and NE 1/4 NW 1/4 and NE 1/4, sec. 24, township 19 south, range 15 east, Willamette Meridian, has filed notice of intention to make final three-year proof to establish claim to the land above described, before H. C. Ellis, U. S. Commissioner, at Bend, Oregon, on the 21st day of March, 1914.

Claimant names as witnesses:

Accidents to the flesh will happen, no matter how careful you are.

Ballard's SNOW LINIMENT

Kent always in the house is a guarantee of prompt treatment whenever there is a cut, burn, bruise or other injury to the flesh of any member of the family. The good effect of these wounds are treated, the greater certainty that they will heal without much pain or loss of time. It is equally certain that the torture of rheumatism, neuralgia and sciatica, lame back, stiff neck and lumbago will be eased, and the disease speedily driven out of the body. If you have it on hand, the suffering is short and the cure is speedy and complete.

Price 25c, 50c and \$1.00 per Bottle.

James F. Ballard, Prop. St. Louis, Mo.

Stephens Eye Salve Cures Sore Eyes.

Now and Recommended by

Patterson Drug Co.

Roofing of all kinds. Repairing promptly done.

J. A. MacCLOSKEY
TINNING AND
Furnace Contractor

Guttering, Spouting, Cornices and Skylights.

FOR WINTER
Wear get a pair of
WORLD'S WORK
SHOES.
Sold by
R. H. LOVEN
the Shoe Repair Man.
Bond street, Bend, Ore

THE WHITE IS KING



The BEST all-round Family Sewing Machine that can be produced. Made in both ROTARY and VIBRATOR styles. The rotary makes both LOCK and CHAIN stitch. The latest up to the minute steel attachments with each machine. Sold on easy payments. Send name and address for our beautiful H. T. catalogue free.

White Sewing Machine Co.
519 Merchants National Bank Bldg.
San Francisco, California

George Millican and Ada B. Millican of Millican, Oregon; Otis C. Henkle and L. G. Baker of Bend, Oregon.
H. FRANK WOODCOCK, Register.

NOTICE OF CONTEST.
Department of the Interior, United States Land Office, The Dalles, Oregon, January 31, 1914.
To William H. H. Swift, of Prineville, Oregon, Contestee:

You are hereby notified that John P. Ames, who gives c-o C. S. Benson, Bend, Oregon, as his post-office address, did on December 29, 1913, file in this office his duly corroborated application to contest and secure the cancellation of your homestead Entry No. —, Serial No. 06154, made April 16, 1910, for W 1/2 Section 15, Township 20, S., Range 20, E., Willamette Meridian, and as grounds for his contest he alleges that said William H. H. Swift has wholly failed to establish his residence on said tract; has totally failed to cultivate and improve same as required by law and has abandoned the same for more than one year last past.

You are, therefore, further notified that the said allegations will be taken as confessed, and your said entry will be cancelled without further right to be heard, either before this office or on appeal, if you fail to file in this office within twenty days after the FOURTH publication of this notice, as shown below, your answer, under oath, specifically responding to these allegations of contest, together with due proof that you have served a copy of your an-

swer on the said contestant either in person or by registered mail.

You should state in your answer the name of the post office to which you desire future notices to be sent to you.

H. FRANK WOODCOCK, Register.
Date of first publication Feb. 18, 1914.
Date of second publication Feb. 25, 1914.
Date of third publication March 4, 1914.
Date of fourth publication March 11, 1914.

Fraternal Societies

I. O. O. F.
Bend Lodge No. 218.
Regular meeting every Monday night at 8 o'clock in Sather's Hall. Visiting brothers cordially welcome.
M. A. PALMER, N. G.
GEO. P. G'VE, Secretary.

THE FRATERNAL BROTHERHOOD.
Bend Lodge No. 897 meets in Sather's Hall every Thursday evening, with social on third Thursday each month. Visiting members cordially invited.
Mrs. G. W. Shriner, Pres.
Leroy Fox, Secretary.

BUSINESS AND PROFESSIONAL.

ROBERT B. GOULD
Civil Engineer
Bend Oregon

BENNETT, SINNOTT & GALLOWAY
Attorneys at Law
General Practice
The Dalles, Oregon

ROSS FARNHAM
Attorney At Law
Office in Jones Building on Wall Street.

J. B. Bell A. W. Sims
CROOK COUNTY ABSTRACT COMPANY
(Incorporated)
Successors to The J. H. Haner Abstract Co., Prineville, Ore.
Abstracts Insurance

W. W. FAULKNER, D. M. D.
DENTIST
Office Over Postoffice
Bend, Oregon

WILLARD H. WIRTZ
LAWYER
Prineville, Oregon.

U. C. COE, M. D.
Physician and Surgeon
Office over First National Bank
Office Hours: 10 to 12 a. m.; 1 to 3 and 7 to 8 p. m.
BEND, OREGON

ROBERT W. SAWYER
NOTARY PUBLIC
Bulletin Office, Bend, Oregon

C. S. BENSON
Attorney At Law
Benson Building, Wall Street
Bend, Oregon.

VERNON A. FORBES
LAWYER
First National Bank Building
Bend, Oregon

GEORGES S. YOUNG
Civil and Irrigation Engineer.
City Engineer of Bend.
Room 5 First National Bank Building

H. H. De ARMOND
LAWYER
Sather Building Bend, Ore.

H. C. ELLIS
Attorney-at-Law
United States Commissioner
First National Bank Building
BEND, OREGON

DR. J. H. CONNARN
DENTIST
Office in Sather Building.
Hours 9 to 12, 1 to 5.
Sundays and evenings by Appointment.

DR. A. B. CROPP
Chiropractor
DRUGLESS PHYSICIAN
Office in old Deschutes Bank Bldg. Hours: 9-12, 1-5. At Redmond Monday, Wednesday and Friday until further notice

C. P. NISWONGER, Bend, Ore.
UNDERTAKER
Licensed Embalmer, Funeral Director.
Phone. Lady Assistant.

SWEATT, LEVESQUE & CO.
312 Mohawk Bldg.
SPOKANE

ARCHITECTS
Schools and Large Buildings a specialty

Can Any Reason be Sufficient
to cause you to delay remodeling the old bathroom?
IS IT PRICE? We can furnish a guaranteed bathroom outfit at a price within the reach of every home owner.
ISN'T IT REALLY JUST CARELESSNESS?
You have intended to get a modern set of fixtures all along but that old thief Procrastination has made you lose the daily convenience, the protection to health, the satisfaction of possessing a beautiful "Standard" modern bathroom.




How's that? No bother to remind you at all, we assure you. We'll bring our catalogue right away.

"Standard" "CLARION" BATH

J. J. RYAN
LICENSED PLUMBER
Minnesota Street.

THE UNITED WAREHOUSE COMPANY



Storage and Forwarding
General Commission Merchants

WE HANDLE OIL, GASOLINE, SUGAR, FLOUR, SALT, HIDES

FRESH and SALT MEATS
HAMS, BACON AND LARD

The United Warehouse Co.
A. M. Pringle, Mgr. Bend, Oregon

TO THE PUBLIC:
We hereby announce that we have taken over the entire insurance business of M. S. Lattin & Co. and are prepared to write any kind of a policy you may wish.

Bend Insurance Company
First National Bank Building Bend, Oregon

O'DONNELL BROTHERS
UNION MARKET