

# High vs. Low Grade Fertilizers

By PROF. A. J. PATTEN, Experiment Station Chemist, East Lansing, Mich.

A fertilizer may be defined as any material, which, when added to the soil, will furnish some form of plant food (nitrogen, phosphoric acid, or potash) to the growing plant, or will materially increase the supply of these in the soil.

A high grade fertilizer is one which contains the plant food in a fairly concentrated and readily available form. Nitrate of soda, bone meal, muriate and sulfate of potash may be mentioned as examples of high grade fertilizing materials.

A low grade fertilizer is one which contains the plant food in small amounts or in slowly or difficultly available forms. As examples of this class, the following may be mentioned: Garbage, tankage, ground treated, dried peat, untreated phosphate rock, etc.

When these materials are sold separately it is not a difficult matter to determine what they are nor how much and how available is the plant food, for they are usually known and sold under distinctive names.

Exhaustive experiments have been made as to availability of the plant food in practically all of the fertilizing materials found on the market today, and such information will be gladly furnished by the state experiment station, East Lansing, Mich.

When these materials are mixed together to form the mixed fertilizer of commerce, it becomes a much more difficult matter to decide as to the availability of the plant food for most of them completely lose their identity. In such cases it is impossible for the ordinary person to tell with the eye what materials were used in compounding the fertilizer.

In respect to the phosphoric acid and potash, however, we may have no misgivings, for almost invariably the phosphoric acid is obtained from acidulated rock phosphate or bone meal, and in either case is readily available. Practically all of the potash used in commercial fertilizers is in the form of muriate or sulfate of potash, and as both these compounds are soluble in water there need be no fear of obtaining unavailable potash.

The materials furnishing nitrogen, on the other hand, are many and varied, and they differ greatly in nitrogen availability. There have been several methods proposed for determining the availability of the nitrogen in such organic materials, but none of them have been generally accepted, so that we are still somewhat at the mercy of the manufacturer in regard to the quality of the nitrogenous materials used in the commercial fertilizers.

There is one rule, however, that may serve to guide us in the purchase of fertilizers. Purchase only those commercial fertilizers that have 15 per cent, or more of total plant food.

High grade materials usually have a high percentage of plant food, and low grade materials, on the other hand, usually have a low percentage of plant food. Thus, nitrate of soda contains 15.5 per cent. nitrogen; dried blood, 12.5 per cent. nitrogen; high grade tankage, 10 per cent., while garbage tankage contains only 3 per cent. nitrogen and more than 2.5 per cent. nitrogen.

300 lbs. dried blood containing 14 per cent. nitrogen.  
1,400 lbs. acid phosphate containing 14 per cent. phosph. acid.  
300 lbs. muriate potash containing 50 per cent. potash.

2,000 The mixture would have the following analysis:  
2.10 per cent. nitrogen,  
9.30 per cent. phosphoric acid,  
7.50 per cent. potash.

1840 The proportion in which the materials are mixed may be varied, but adding no inert material (filler) to the mixture will result in a high grade fertilizer.

1,200 lbs. acid phosphate containing 14 per cent. phosph. acid.  
300 lbs. kainit, containing 12 per cent. potash.

2,000 This mixture would have the following analysis:  
0.70 per cent. nitrogen,  
6.40 per cent. phosphoric acid,  
1.50 per cent. potash.

1050 If samples of these two mixtures were placed side by side it would be impossible for the ordinary person to tell from their appearance which of the two was the better.

It is invariably true that the plant food costs more per pound in the low grade fertilizer than in the high grade fertilizer. In other words, it would be more expensive to retail for \$23 per ton costs more per pound than in a fertilizer retailing at \$40 per ton. The plant food in the high grade fertilizer is more concentrated and less of it will be required than of the low grade to produce the same effect.

# ASK YOURSELF THESE TEST OF "WHAT'S THE USE" FOR THE SELF-SATISFIED.

Here Are a Few Pertinent Suggestions for Daily Living That Will Help to Make You and Your Friends Happier.

"That old cry of 'cut throats' is supposed to be the hallmark of the pessimist, but many a self-satisfied one would do well to put the test of 'What's the use of sitting so hard for a rainy day that you get no fun out of the passing sunny ones?' This was the motto of the late General Grant, and the woman who prides herself on her thrift and reviles the spendthrift habits of her friend will do well to ponder it.

"What's the use of a charitable purse and an uncharitable tongue? Kind words are infinitely more than contributions or donations on a subscription list."

"What's the use of playing the lamb in society and a wolf in the family circles? Walls have ears, also neighbors have tongues and the real you is not unknown.

"What's the use of posing as a pedagogue with a time no need for labeling, and you'll never convince the person with brains that you prefer Darwin to the Duchess.

"What's the use of being a cat to your best girl friend because of a man? The girl will get even and the man sees through you.

"What's the use of rubbing your health to gratify your ambition? The quicker a woman leaves the unhappy mess of life when half ill the bigger chance she stands of success.

"What's the use of spending money on skin specialists and digestive tablets while dallying with the things you should not eat?"

"What's the use of playing young when the years have you in their grip? Age is not so unlovely that the aging should treat it as a disgrace and make a charming old woman than a pitiable mimicry of youth.

"What's the use of getting down on your luck? There is nothing like a smile to boost you out of the mire."

"What's the use of kicking? It doesn't make life any sweeter to think yourself a victim—nor does it increase your popularity.

"What's the use of cultivating automobile tests on a walking income? There's joy and health in a good walk if you once fight the speed craze.

"What's the use of striving for the big bubble when you would be so much happier the small one? Learn to make life any sweeter to think yourself a victim—nor does it increase your popularity.

"What's the use of sipping work? This is an age that demands our best; if we give counterfeits we pay a counterfeiter's penalty."

"What's the use of sham of any kind? One need not be brutally rude to be sincere. It is the untrained taste that prefers ormolu to the gold nugget."

"Johnny Defies a Good Boy." A distinguished visitor was making a short address to the Sunday school. "I am glad to see so many nice boys and girls assembled here today," he began. "You are the big boys and girls of the town. There are boys that are always punctual at school, always have their faces and hands washed, play hooky, and yet they are good boys. Then there are the boys that like to torture cats and rob birds' nests and bully boys that are smaller than themselves and steal apples from the grocery stands and smoke cigarettes that sort of thing. These we call bad boys. Yes, there are several kinds of boys. Now perhaps you can tell me what kind of boys go to heaven?"

"Up went Johnny's hand like a flash. 'Well, my little man, said the visitor, smiling complacently and nodding his head at Johnny, 'what kind of boys go to heaven?'"

"'That one's!' shouted Johnny at the top of his voice.

"Ruskin as a Grocer." Ruskin was once a grocer. In 1874 he opened a shop in Farringdon street, Notting Hill, in order to experiment, "to supply the poor with pure tea in packets as small as they chose to buy, without making a profit on the subdivision, large orders, of course, equally acceptable, and anybody who cares to promote honest dealing." The shop did not attract Ruskin complained in Fors Clavigera that "the poor only like to buy tea when they are in a hurry, and they are not likely to buy it in a shop."

"Observing the Proprieties." "Everybody starts in to say something when I begin to play," protested the distinguished musician. "Yes," replied Mrs. Cameron. "You are so stupid. Just because I play a piano, recital everybody seems to feel called up to recite."

# W. L. DOUGLAS' TRUST PLAN

Manufacturers Think Government Should Obtain Publicity by a License System.

Large business organizations have come to stay! We cannot go back to old conditions. We must meet world competition. Large concerns can produce goods at lower cost than small ones. Germany favors large concerns. The method of the Federal International Administration is to dissolve the great organizations, and make them smaller, which is a backward step. There should be no limit to a corporation doing a large and legitimate business, such as would be possible under the licensing plan which I favor, writes W. L. Douglas, former governor of Massachusetts, in the Boston Herald.

Prejudices against corporations merely because they are big, perhaps, must be done away with. They give labor better returns. They check and thus benefit the consumer. They give opportunities to small investors who get returns otherwise unattainable. They employ able young men who have no capital at all. They give "recruits" to various industries in place of the Sherman law. It is my opinion there should be a department at Washington to grant licenses to all manufacturers and corporations in this country who do an interstate commerce business.

The law should be made so clear, plain and definite that it could be administered by a layman. It should be paid in full. Semi-yearly statements should be given to the public and certified by a public accountant in each state to look after these corporations just as our national banks are watched by the national government. They should have the right to enter the offices and examine the records of all the directors of these companies.

Naive Optimists. "Six months ago there was another outbreak of optimism as naive though the world were still listing in the sentimental era of glass exhibitions. Since then there has opened another era of political earthquakes and confagurations, and the area of disturbance in each state to extend. Be sure the capital problem has been safely liquidated or the peace of the Balkans is assured, we have the outbreak in China of an insurrection which may check the flow of the far east and give an incalculable increase of force to all the impulses set moving by the triumph of Japan. All we can be certain of in the rest of the world politics is that nothing is certain. Do we need further lessons to convince us that the peace of civilization is founded upon the crust of a volcano?" asks the London Observer.

USED HYPODERMICS. Only Relief from Terrible Suffering. Thomas B. Veal, 1605 So. 12th St., Terre Haute, Ind., says: "I had been in control over the urine and the pain when voiding was so great, I often screamed. I in bed worse and lay in bed for weeks for relief coming from hypodermics. I was treated by three physicians without help and the last one said an operation was necessary. I hereupon began using Doan's Kidney Pills and passed a gravel stone as large as a pea. The next day I had passed two more and from then on improved rapidly until cured."

"When You Back In Lame, Remember the Name—DOAN'S!" 50c. all stores. Foster-McMillan Co., Buffalo, N. Y.

The Optimist. Ex-Senator Mason of Illinois gave a new denunciation of optimists in a recent speech before the Boston City Club. "A true optimist," said the able senator, "is a man who is able to make lemonade at night out of his lemons handed him during the day."

A USEFUL XMAS GIFT for man, woman or child is a good fountain pen. Waddington's idea is the best pen made and the one that is most faulted; therefore insist on the genuine. Sold by all good dealers.

A little candle went out walking one dark night, had high and flies, moths and men gave it attention; the next noonday it went out again; but no one noticed it.

But neck! Doesn't amount to much, but mighty disagreeable. You will be surprised to see how quickly Hamlin's Window Oil will drive that disagreeable one right, that's all.

In Hard Luck. Hewitt—you are always broke. Jewitt—I know it; I couldn't raise the wind with an electric fan.

Constipation causes many serious diseases. It is thoroughly cured by Doctor Pierce's Pleasant Pellets. One a day, three for cathartic.

Located. Stella—If the third finger is for the edging ring, which is for divorce? Bella—The finger of scorn.—Judge.

Dr. Winslow's Soothing Syrup for Children teething, softens the gums, reduces inflammation, allays pain, cures wind colic, &c. Sells everywhere.

If thought photography ever becomes practical the world will learn some astonishing secrets.

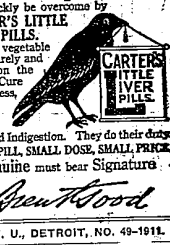
Color more goodly lighter and faster color than any other dye. One package colors all dyes. They do not fade or run better than any other dye. You can dye any garment without tipping apart. Write for free booklet—how to dye, blacken, etc. MONROE DYE COMPANY, Galley.

One of the Boones. From San Antonio, Tex., Harry Boone, itinerant scribbler, drifted into town a couple of days ago. Introduced as "Mr. Boone," he said: "Yes, call me Daniel Boone," but my name, but I'm always called 'I'm getting used to it. Which reminds me; I was introduced to a fellow named 'and gave him the initial part of it so he would remember the name. The next time I met him he said: 'How are you today, Mr. Crockett?'—San Francisco Chronicle.

Why did you leave the place in which you were previously employed?" asked the head of the firm. "I think," said the applicant for the position of office boy, "do boss was afraid if I stayed I might give his place."

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## W. L. DOUGLAS

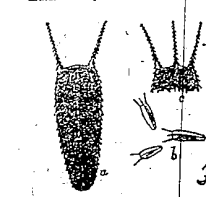
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# PEST COMMON ON LOWLANDS

Beggar-ticks an Especial Nuisance in Pastures Lying Along Ditches or Bordering Swamps.

(By R. J. BALDWIN, Michigan Agricultural College.) This weed is familiar to everybody by one or more of its numerous names, such as beggar-ticks, devil's pitchfork and stick-ticks. While it does not invade cultivated fields except on low lands, this weed is an especial nuisance in pastures lying along ditches or bordering swamps. On such lands it produces a rank, dense growth of stems so high as to injure animals. The spreading stems, which are



Seeds of Beggar-Ticks.

soft and succulent when young, ripen into stiff, strong branches bearing the forked seeds on their extremities. These seeds are held out rigidly to be run into by animals and carried away in their coats. It is this feature which gives a nuisance because the seeds lodge in the wool and deprecate its value, stick in the coats of other animals and cling to the coats of the human family. The plant cannot withstand cultivation where the land is drained, but in swamps and river bottom lands, is more difficult. Usually the easiest way is to let the land rest, and then to plow and other pasture plants get a start. Those who soon replace beggar-ticks as well as other swamp weeds.

Regularity With the Feeders. Clove-ticks regality in the feeding and watering of cattle on full feed is of the utmost importance. It is possible the same man, even, should always do the feeding, and it is important that this be the most intelligent and trustworthy man on the farm.

It is scarcely possible for a man to get the best gains out of cattle and to get them all to come along willingly and have no foundation and "breakdown" unless he takes a personal interest in the work at hand.

# Treatment for Insects in Stored Grains and Seeds

By R. H. PETTIT, Entomologist of Michigan Experiment Station

The treatment for dried grains containing insects is comparatively easy, providing the grain or seed is in tight bins or barrels, capable of being tightly and quickly closed. Old carpets, blankets, etc., are the best material found useful in helping to make the bins tight.

Measure the inside of the bin, counting in the air space above the grain. If the bin is not entirely full, place a piece of the liquid in a tin on top of the grain. Then for every cubic foot of space in the bin, put a dram of liquid carbon bisulphide in the pans and quickly close the bin. The vapors of the liquid will suffice for about one hundred cubic feet of space or a little more, or for about one hundred bushels of grain. This treatment is far more effective than any other in cold. During severe cold weather the insects are dormant and resist the action of the fumes quite successfully.

If the seed or grain is more than two or three feet deep in the bin, the liquid should be poured into it at some depth in order to insure its spreading evenly and filling all the space treated. This is easily done with a piece of galvanized iron sheet or wooden stick for its entire length. The pipe with the stick in place is thrust down half way to the bottom of the bin, the stick withdrawn and the hole closed down through the pipe. The stick merely prevents the pipe from becoming filled when thrust into place. The bin should remain tightly closed for from twenty-four to forty-eight hours, a longer exposure is likely to injure the germinative power in some seeds.

The liquid carbon bisulphide, on being liberated, will be "heavily" settling to the bottom of the bin, and there the air, settles to the bottom and fills all the air spaces between the seeds or kernels. The liquid costs about ten cents for a day's work, and five cents for a dollar. The work must be done in the day time, away from lamps, stoves or fire of any sort. No fire must be allowed to come near the bin, and the bin must be thoroughly aired for five days after it has been so treated.

Great care must be taken to "breathe" the grain, and to "breathe" it as many as possible of the fumes as they are very poisonous and may be easily produce death among men as among insects.