"The Progressive Farmer is a good paper—far above the average—and possibly the best advertising medium in N. C." Printers' Ink.

# THE PROGRESSIVE FARMER.

Has the largest circulation of any family, agricultural or political paper published between Richmond and Atlanta

THE INDUSTRIAL AND EDUCATIONAL INTERESTS OF OUR PEOPLE PARAMOUNT TO ALL OTHER CONSIDERATIONS OF STATE POLICY.

Vol. 13. RALEIGH, N. C., JUNE 7, 1898. No. 18

## Agriculture.

EDITED BY BENJ IRBY, RALEIGH, N C

Prof. Benj. Irby, late Professor of Agriculture, Agricultural and Mechanical College, Raleigh, has become a regular contributor to this department. All questions relating to the farm, garden or orchard will be answered by Prof. Irby.

### THE COW PEA.

**Its Advantages, Range and Best Method of Culture—An Authority on the Question Gives His Views**

Correspondence of The Progressive Farmer.

There is a class of plants which may be termed "soil builders," whose importance in the scheme of modern farming it is hardly possible to overestimate. All vegetation helps in a way to transform into arable ground the crude rock dust of which all soil is formed. But leguminous plants have a special office in the economy of nature, which experience and scientific investigation alike serve every year to more and more illustrate and emphasize. These plants are nitrogen gatherers. This most costly element in all complete fertilizers and one which is absolutely essential to plant growth, the pod-bearing family of plants, can readily and cheaply supply.

One of them, clover, has for ages been used for the renovation of exhausted soils. Its range of culture is, however, somewhat limited, and even where latitude and climatic conditions would seem to be favorable to its success, it is often found to make an unsatisfactory growth.

Of late years another leguminous plant has been coming to the front, and that is the so called "cow pea." It is not a pea at all, but a bean, and like many other members of the *dolichos* family is probably of semi tropical origin. South of the range of successful clover culture, this bean has for a long time been almost without a rival. But it is coming northward. It is found that its range of profitable growth is much wider than has been supposed. It will succeed in many cases where clover completely fails. It will make a fair growth, at least of vines, in a soil that is too poor for clover. It is quite indifferent to ordinary drouth. It is of exceedingly rapid growth and of course gives quick returns. Even in the extreme Northern States a large amount of forage could in most instances be obtained, by sowing when all danger of freezing has passed and the soil is reasonably warm (and harvesting or plowing under the rank growth of vines which the hot summer months are certain to give.

For hay the cow pea is excellent. If well cured it is fully equal to the best mixed timothy and clover. The vine is, however, very watery, and therefore difficult to dry. Especially is this the case in the extreme Southern States where the rainy season usually covers the harvest period. Further North, by taking advantage of a dry time, success will be reasonably certain. For forage and green soiling the cow peas has no superior.

But for soil improvement it is doubtful whether even clover at "its best estate" is superior the cow pea. Like the former, its benefits to the soil are partly mechanical and partly chemical. If turned under immediately before the coming of autumn frosts, this legume furnishes a rich store both of humus and available nitrogen. In the extreme South, this plowing under must be deferred until the late autumn, and the vines have become partially dry, since a deleterious acid formation is liable to set in if a mass of succulent vegetation is buried under the surface soil while the average daily temperature still ranges above the 70 mark.

The day will come—if it is not already here—when no farmer can afford to buy nitrogen as a fertilizer. He must "raise it" as he does other crops, by means of clover, cow peas and other legumes. He can obtain it in this way at a quarter the cost for which he can buy it of the fertilizer agent. Even stable and barnyard manure, valuable as they are, and carefully as they should be husbanded, should be looked upon rather as adjuncts than as the main source of supply of these two most essential elements o. fertility and profitable crop production, humus and nitrogen.

One caution, however, cannot be too often repeated and that is this, while cow peas can get all the nitrogen they need from the air, nevertheless they must depend upon the soil for their supply of mineral food, phosphoric acid and potash, and if these are not already present in sufficient quantities and in readily available condition they can be easily supplied in the form of superphosphate and the various salts of potash. An average application would be about 300 pounds acid phosphate and 100 pounds muriate or sulphate of potash per acre, supplied broadcast and worked into the soil before the seed is sown.

Cow peas may be planted in a variety of ways. A method that the writer has often pursued saves labor. This is to have an intelligent careful boy drop them at a distance of eight or ten inches apart—the exact distance is not material—in every alternate furrow when the land is last plowed in spring. They are of course covered the next round. They do equally well sown broadcast, and harrowed in or in drills. From one to two bushels of seed to the acre will usually be required.

It is useless to attempt to hurry the cow pea at planting time. When the soil is warm enough for melons to grow the cow pea will succeed, and not till then.

For more Northern regions, the "Black eyed," "Red Crowder" or Whippoorwill" or some other rapid-growing variety should be selected. Further South the "Wonderful," "Clay," "Red Ripper" or some other rank and luxuriant vine producing sort will usually give the best results.

NORMAN ROBINSON.

### KEEPING MANURE NEAR THE SURFACE.

In a recent issue of Practical Farmer the subject for discussion was: "Farm Manure: Is it best in Your Experience to Plow it Under Deeply or Keep it as Near the Surface as Possible?" Answers came from all parts of the country. A North Carolina correspondent says:

"It depends somewhat on the crop. On the corn crop, where most of it should go, it should be plowed under, though there may be exceptions to this. I never liked the big two and three horse plows with a jointer for plowing under manure for when it is put in the bottom of an 8 or 9 inch furrow it is down too deep and no crop gets the full benefit of it until it is turned up again, and by that time a great deal of it is lost. But for the corn crop it should be turned under with an ordinary plow, unless the soil is very sandy, when it may be better to keep it near the surface. I try to get my manure out on land intended for corn as fast as made, and with as little labor in handling as possible. It is hard enough work to handle it once. If it is to be used on a winter grain crop I would always haul it on the rough-plowed land and harrow it in. It will then give the grain a good start and help the grass roots."

Another Tar Heel writes:

"I find that it pays to keep the manure near the surface, unless it is very coarse and will be in the way. If it is near the top, as the plant food leaches down through the soil with the rains, it will be absorbed by the soil and feed the plants. But if buried down near the clay, the clay will take up a large part of the manure out of reach of plant roots. Real coarse manure turned under on stiff land deficient in vegetable matter mellows the soil."

Prof. W. F. Massey reviews all the evidence and sums it up in the following words:

"The preponderance of experience is in favor of keeping the manure near the surface as a rule and we believe that this is the true plan, and we would add on the surface as nearly as possible. Many of our friends still seem to be imbued with the old liking for well rotted manure. We do not want to let our manure get well rotted before we apply it to the land. The place to rot the manure is in the soil, where you have the soil to absorb everything. If the manure is spread on the surface the soluble parts wash immediately into the land, and the loss is smaller than in any way the manure can be treated, far less than piling in the barnyard either under cover or out. The evaporation from manure spread on the surface is mainly only water, while the evaporation from piled manure is largely ammonia in a volatile form. No matter how well the manure is handled, there will always be more loss from it in the barnyard than in the field. Manure on the surface keeps the soil moist and prevents the baking of a clay soil. In our experience, right on top as near as may be is the best possible place for the manure. Lately I have had an example on a small scale of the value of surface manuring on a clay soil. A year ago we built at our college a new lecture hall, laboratory and greenhouses for my department. To get a level site for the buildings we had to excavate into a red clay hillside and pile the clay taken from the excavation in the lower levels. On the grounds around this building I have been trying to convert this clay into a garden. Grass plants were formed and large shrubbery beds prepared, and planted in the untamed clay. After everything was planted a good coat of manure was placed on the surface and left there. Last summer was the hottest and dryest ever known here, but it was pleasant to see how things grew and flourished in that clay which was merely the subsoil piled three or four feet deep. This spring the soil in these beds works as mellow as the traditional ash heap and the bloom of the roses and shrubbery of all kinds is simply amazing, being fully twice as great as with the same kinds of plants set in natural soil everywhere. I use all manure as a mulch either in garden or field. In the garden, after setting plants or planting seed the manure is spread over the surface and left there to be slightly worked in during cultivation. On the farm, the place for the farm manure is on the clover as fast as it can be gotten from the stables. There is but a little while during the early summer when it cannot be put there, and then we are usually too busy to haul it out. But except in making a fine compost for greenhouse use, composting is about the worst waste of time and labor that a farmer can engage in. Manure is heavy and expensive stuff to handle in proportion to its value, and it does not pay on the ordinary farm crops to spend time piling and turning a lot of earth, litter and droppings and imagine that it is all manure. Far better get the droppings out as fast as made where they will help to grow the compost all over the land in the shape of peas or clover. A pile of well-rotted manure containing half a dozen or more loads is simply all that is left of four or five times the amount which has largely gone to waste in the turning and fining. The silliest of all ways to handle manure is to haul it to the field and laboriously fork it into little piles, when the spreading could be better done at once from the wagon. The place of all others for the manure is on the clover, and the time to put it there is as soon as you can after it drops in the stable. Do not be afraid of the sun shining on it or the winds drying it, or of its running down hill, for if the soil has a goodly proportion of clay in it, it will take and hold the manure and when the sod is plowed for a hoed crop the plant food is right where the corn needs it, near the surface. There is nothing in which there is more waste on the farm, both of fertility and labor than in the handling of the manure. Manure is not a thing to hoard, but like money, should be put at once to interest. Every day you keep it idle in the barnyard you are losing the interest it would be making on the field. Rotting manure is simply wasting manure. Let it rot on the land where every drop will feed a plant."

### WEEDS.

The almost abnormal rainfall our farmers have had to contend with this spring will bring them abundant work to keep down the weeds which will spring up and flourish in rank luxuriance unless much time and attention is spent in keeping them down. In a little work by Prof. Shaw, of the Minnesota Experiment Station—"Weeds, and How to Eradicate Them," he says: In good farming weeds should not be tolerated at all, because (1) they rob the useful plants that are cultivated of their due share of nutriment; (2) they also injure them by crowding them and shading them; (3) they greatly add to the labor of cleaning grain for market and for seed; they are usually not of much value for food; and (5) they frequently interfere with a regular rotation. To which may be added that the longer they are left to grow unchecked, the greater is the work required to completely subdue them. Weeds feed upon precisely the same kind of food as the useful plants amid which they grow, and they are nearly always much more capable of gathering food from the soil. When found growing in a crop, therefore, they deprive either that crop, or the crops that come after that one, of precisely that amount of sustenance which they consume during the period of their growth. The quantity of plant food, therefore, which weeds take from the crops and the soil will be in proportion to the numbers in which they are found. Nor should it be forgotten that plant food externally applied, oftentimes at much cost, as in the case of commercial fertilizers will be utilized by weeds quite as readily as the plant food naturally available in the soil itself.

When useful plants and weeds commence to grow at the same time, the weed will nearly always, in the race, leave the useful plants behind. This is owing to the superior power of gathering plant food, which weeds, in nearly all their varieties, possess. When present, therefore, in a crop, they grow, in most instances, more vigorously than the crop itself; and as the latter is intended to grow so thickly that it will require all the room that can be given to it to enable it to perfect its growth, it follows that the injury through crowding from weeds will be in proportion to the number and vigor of the weeds. Weeds also grow more quickly than useful plants; hence, by their shade, they hinder that perfect development of the useful plants which abundant sunlight is necessary to secure.

### LOSS OF FERTILITY IN DRAINAGE WATER.

Farmers' Bulletin 78: Among the principal causes of loss of soil fertility are (1) the growth and removal of crops without restoring the equivalent of the fertilising constituents they contain, (2) surface washing, and (3) leaching. All crops contain a considerable amount of fertilising matter drawn from the soil. It is evident, therefore, that if these crops are grown continuously and sold away from the farm without return of an equivalent in manure or fertilizers the soil must in time show a decline in fertility. The harmful effects of surface washing is a matter of common observation and needs no further discussion here. The loss of fertility in the drainage water, however, is a subject not so well understood. The loss from this cause is generally supposed to be very considerable, and under certain circumstances this is true, depending upon the character of the soil and the treatment to which it is subjected and the fertilizers applied. "Leachy" soils part very quickly with the fertilizing materials applied to them unless covered with crops which utilize the fertilizers promptly.

Certain fertilizers also have a tendency to set some of the soil constituents free and thus throw them into the drainage water. As the Massachusetts Station has shown, this is especially true of muriate of potash, which converts the insoluble lime compounds of the soil into a very soluble form, which readily passes into the drainage water. The application of lime compounds (gypsum, etc) and salt is believed to set free the potash and other fertilizing constituents of the soil, thus rendering them more available to plants, but at the same time more likely to be washed out and lost in the drainage water. While these are all possible sources of loss, it is probably safe to say that under ordinary conditions the chances of loss of appreciable amounts of lime, potash, or phosphoric acid in the drainage water of soils are very small. This conclusion is confirmed by numerous chomical examinations of drainage water which have been made by experiment stations and similar institutions in the United States and elsewhere.

As regards the loss of the important and expensive fertilising constituent, nitrogen, however, the case is very different. The soil appears to have very little affinity for the forms of this element so extensively used in fertilizers—nitrate of soda and sulphate of ammonia—and if they are not quickly taken up by the crop they are likely to be lost in the drainage water. Moreover, the soluble nitrogen of the soil (in humus) or that applied in the form of cotton seed meal, dried fish, etc., which are also largely insoluble when applied, is rapidly converted by the process of nitrification under favorable conditions into nitrates, which are readily available to plants but which pass out in drainage and are lost if not taken up promptly by the plant. Experiments have been reported in which the loss of nitrogen in the drainage from a bare soil in the course of a year was over 160 pounds per acre, while the loss from a soil which was kept was kept covered by a crop was almost insignificant, although fully as large amounts of nitrates were formed in the latter case as in the former. This affords a striking illustration of the importance of keeping a leachy soil covered with a crop in order to prevent serious loss of the most expensive element of fertility—nitrogen. Such a practice would protect the soil from both leaching and surface washing—probably the two most serious causes of decline of fertility of soils.

### SCIENTIFIC NAMES.

It is within my personal knowledge that very many intelligent farmers regard the names of the various elements of plant food in a commercial fertilizer as too hopelessly scientific in form ever to seem familiar to them. In compounding a ration for a cow or horse they feel very much at home using the terms "bran," "oats" and "corn," but in compounding a ration for plants the names of the elements, "nitrogen," "phosphoric acid" and "potash," do not become commonplace and easy. It is no more "scientific" to call nitrogen by its name than to call John Jones by his name, and as the forms of nitrogen are much fewer than the forms of "Jones," the former should be by far the least confusing. Of the various elements that plants must have in order to make growth we pay attention to only four because these four—nitrogen, phosphoric acid, potash and lime—seem to be the only ones ever lacking in ordinary soils. If we were compelled to look after all the elements required in plant growth, the matter would be confusing, but when there are never more than four we should be willing to become pretty well acquainted with their names. It is usual to pay no attention to the lime, as it is supposed to be rarely lacking as an actual element of plant food, and so we have only three. The three are used to form a "complete fertilizer," but that is a misleading team, as the three may not be needed in order to complete the supply in the soil needed by plants. All the elements are dropped out of consideration except the four that have been named, and of these four a soil may need only one to complete its power to produce good crops, or it may need two of the elements, or three, or all four. When we buy and supply an element that is not needed we cut down the profits from the use of some other element that we also supplied and was needed. The practical farmer has two problems before him: (1) What element or elements must he supply to his soil, (2) in what form can he get the largest and most effective quantity of this element for a given amount of money?

The careful attention of our readers is called to the following from the pen of Director Hilgarid, of the California Station. The Director says: "Were the immediate return of everything that the crops take away necessary on every soil, the possessor of rich land would have no advantage over the owner of poor land; for so soon as the first flush of fertility is exhausted in the virgin soil, both would be equally obliged to supply the full amount of ingredients withdrawn from the soil by each crop. But the experience of centuries has shown that such integral replacement is altogether unnecessary on very many lands, and, as a result, the use of a complete fertilizer is in Europe a rare exception, save as regards stable manure. Farmers buy the individual ingredients, as furnished in commerce, according to the supposed requirements of the land as deduced either from its previous history, or from the known richness of the soil in either one or the other ingredient in question. In the United States the habit of purchasing everything 'ready made' prevails to an unusual extent, and fertilizer manufacturers mostly cater to this demand by supplying 'complete fertilizers,' compounded in accordance with the known requirements for certain crops therefor, on the supposition that the soil supplied nothing of itself. In purchasing these complete fertilizers, the farmer is therefore likely to pay for one or perhaps two ingredients which the soil may not require at all to produce the most profitable crops, when his money would probably be much better spent in procuring a larger amount of one substance specially needed. The enormous waste of money thus incurred is now so well recognized in Europe that the manufacture and sale of mixed fertilizers has been almost completely superseded by that of the samples themselves. The farmer buys superphosphate, potash salts, or nitrogenous fertiliser separately, in accordance with a rational understanding of the requirements of his land; more particularly with reference to the nature of the preceding crop, the amount and kind of the draft made on the land, and the character of the latter."—Ex.

### GOOD ROADS AT REASONABLE COST.

**A Plea for Wide Tires.**

The public is vitally concerned in the maintenance of good public roads. I certainly am, for every time we go to church, every load of fuel handled, necessitates a travel of ten miles going and coming. The road has always been rough, and it seems to me that under a different system of management and with the use of wide tires, this and many of our country roads could be greatly improved.

This stretch of road runs through a section of moist, springy land, and no one ever yet saw a good road across such land where the water in the side ditches was as high as the roadbed. Wheel road machines have been in use for some years, but the roadbed has been left narrow, with only a shallow ditch and this within a foot or so of the wheel track. The result has been that loaded teams in passing have been obliged to cut out into the ditch, and in coming into the road again, a depression was made at an angle by which the water from the ditch was led into the road and would follow the rut for half a mile in places. I contend the travelling public has a right to complain of such an abuse in the shape of so called road work. I speak of this particular road because I go over it more, and know it better, but it only represents a large proportion of our country roads.

Some one, however, will say: "It is easy to find fault—what is your remedy?" I always like to answer questions by a presentation of facts. Our farm lies just off the main road, and is all moist land. As we do our own road work, my study has been to make every stroke of work count. I hired a road worker, man and team, one day, several years ago, at a cost of $7 and it was practically money thrown away. He made the road bed narrow, and in the winter following it was impossible to keep sleighs on it. The following spring, we took our picks and shovels, and dug a ditch three or four feet from the wheel track on the upper side, where there was most water, throwing the earth and gravel on the road. A spring tooth harrow was used on this until every rut and hole was filled. The stone stirred up were raked out with a garden rake, and drawn to a low, moist place in the road and covered. Not a particle of water has been seen on the ground since, except as it has fallen, and the ditch being so much lower, the surface of the road soon dries after a rain. If only 6 inch tired loaded wagons went over it, there would never be a rut.

This, then, is my remedy: First make a deep ditch, far enough distant from the upper side of the road, if on sloping land, so that there should be no danger of driving into it (I would make this ditch not less than 2½ feet deep); provide suitable outlets in lowest places, to carry across the road, and then allow no loaded wagon on it with tires less than 6 inches in width. But I hear some one say: "How am I to draw a wagon load on 6 inch tires over ruts made by 1½ inch tires?" This is just the point I wish to get at. No truth is more clearly recognized to day than that good roads through the State would add immensely to the value of property; hence the whole State would be benefited. My idea would be to enact a law compelling the substitution of 6 inch tires on all wagons carrying one ton or more—one half the cost of the change from narrow tires to be paid by the State, if made within one year, and one-half by the owner; after one year's time had been given, the whole cost to be borne by the owner. Of course, one man would not be willing to use a 6 inch tire on the road while ten others were cutting deep ruts by the use of ordinary narrow tires. I have found this true in my own experience. Where deep ruts have been made by narrow tires, the use of wide tires over the same road has in a short time obliterated the ruts, and left a hard, smooth surface.

The Missouri Experiment Station (Bulletin 39) made a series of experiments on all kinds of roads, from hard macadam to sod, both dry and wet, plowed ground and mud roads, and found the 6 inch tire drew materially lighter on all rods except when soft and sloppy on the surface, or where mud was very deep and sticky. It must be borne in mind, however, that we should have no such depth of mud at any time on our roads were the use of narrow tires prohibited. The good roads

[CONTINUED ON PAGE 8.]