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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.

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We want intelligent correspondents in every county in the State. We want facts of value, results accomplished of value, experiences of value, plainly and briefly told. One solid, demonstrated fact, is worth a thousand theories.

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THE PROGRESSIVE FARMER is the Official Organ of the North Carolina Farmers' State Alliance.

"I am standing now just behind the curtain, and in full glow of the coming sunset. Behind me are the shadows on the track, before me lies the dark valley and the river. When I mingle with its dark waters I want to cast one lingering look upon a country whose government is of the people, for the people, and by the people."—L. L. Polk, July 15, 1890.

PRACTICAL FARM NOTES.

Written for The Progressive Farmer by the Editors and Hoq. Guy E. Mitchell

We understand that the peach crop in this section is not so seriously damaged as one might infer from our article on this subject last week.

Here's a good hint from an exchange: What is more bleak than a house without a shade tree near it? There are many rapid growing and ornamental trees that succeed well on most any soil; and they cost but a trifle. Better set out some this spring.

Now that you are buying your tools and fertilizers for the crop of 1899, do not forget to renew your subscription to The Progressive Farmer, which we hope to make of as much service to you as any \$1 tool you can get. Just above this item is that little red slip to which we occasionally call your attention. Watch it, and if to day you hear its voice, harden not your heart.

No farmer who takes any interest whatever in guano and fertilizers should be without a copy of "Plant Food," a valuable and interesting little work just issued by the Experiment Farm at Southern Pines. We advise every farmer reader to drop a postal to "Director Experiment Farm, Southern Pines, N. C.," for a free copy. The book is well printed and handsomely illustrated.

The Horticultural Department of the Michigan Experiment Station has just issued a bulletin that is likely to be valuable to many of our readers who are interested in fruit growing. It is "A Spraying Calendar," with directions for applying the various insecticides and fungicides for the different insects and diseases with which fruits and vegetables are attacked. A postal card, addressed to The Secretary, Agricultural College, Michigan, requesting that this bulletin be sent, will secure it for you.

As the time for planting forage crops is near at hand, we request our readers who have had experience with those not generally cultivated—such as Spanish peanuts, whippoorwill peas, broom corn, velvet beans, etc., etc., to "write up" their experiences. We are glad to see that our efforts to cooperate with our readers to improve the condition of agriculture in this and adjoining States are appreciated, but only by our co-operation with our readers and their co-operation with one another can the paper be made as useful as it might be.

The legislature tabled the bill to have the elementary principles of agriculture taught in the public schools, but that is no reason why you should not teach your boys something of the science—the whys and wherefores—of the business of farming. One of the best books we have ever seen on this

subject is Prof. L. H. Bailey's "Principles of Agriculture," a neatly bound and printed book of 300 pages. Every farmer who has not had the advantages of a course at an agricultural college should read it, and should also see that his boys read it. We believe it would pay any farmer to without a new plow if necessary in order to purchase this book. Thousands of dollars are wasted every year on fertilizers unsuited to the land to which it is applied, which money might be saved to the farmers by reading this book. It is time to get out of the old ruts; time to quit planting corn and killing hogs "in the moon;" time to quit letting timothy hay go to seed because it lasts longer—time, in short, to learn that farming is as much a business as banking and the progressive farmer must study his business just as the banker does. This book helps those who read it to do these things; helps them to get into the current of progressive agriculture. We will send a copy to any address upon receipt of price, \$1.25. Address The Progressive Farmer, Raleigh, N. C.

Here is a paragraph from Farm and Home which we commend to our farmer readers. Study it, and remember it. And don't forget that there is yet time to reorganize your Sub Alliance. Be sure to have a meeting in time to send a delegate to the county meeting in April. Here is the item:

"Never before in the history of our country has capital combined for its crease and mutual protection as during the past six months. Corporation is a species of co-operation, but the evil effects to consumers and to producers of the raw material have become so manifest there is widespread dissatisfaction. New Jersey, the paradise of corporations, has a treasury overflowing from fees and taxes from the more than three billions of dollars of stock capital in that State. While business interests are combining as never before, farmers sit by apparently comfortable and satisfied. The great New York State Grange, representing 50,000 farmers, in a State where a large per cent. of all corporations have their home office, has but little to say concerning their methods or work. Occasionally, we hear of discontent among farmers and a sincere desire to organize to stop this oppression. Have the screws been turned so tight farmers dare not arouse themselves? We believe not. It is not too late, before spring work comes on, to form a local organization to help right oppression's wrongs. Organize, agitate, cooperate, is the banner under which farmers and laboring men must work together during the early years of the new century."

A most elaborate series of tests, comparing the relative loads that can be hauled on wide and narrow tired wagons, were made recently by the Experiment Station in Missouri, and extended through two years with the following general results:

- On macadam roads 26 per cent. in favor of wide tires.
- On gravel roads 26 to 45 per cent. in favor of wide tires.
- On ordinary dirt roads 22 to 71 per cent. in favor of wide tires.
- On ordinary meadow lands 22 to 84 per cent. in favor of wide tires.
- On pasture lands 26 to 89 per cent. in favor of wide tires.
- On stubble lands 34 to 72 per cent. in favor of wide tires.
- On plowed ground 33 to 44 per cent. in favor of wide tires.
- On clay road with deep mud and deep ruts 10 to 49 per cent. in favor of narrow tires. But with the general introduction of wide tires, this condition of things would not exist.

We are glad to note that the legislature passed a measure "to encourage the use of wide tires" in certain counties. It applies to a section of the State far too small, but it is a step in the right direction and with proper education and agitation, the legislature of 1901 may be induced to pass a general law of this kind. The wide tire movement is rather new in this State, but it is making rapid progress.

A correspondent of the Charlotte Observer tells of hearing a young farmer "speak a parable" a few days ago just after selling a fine beef cow on the Charlotte market. He said: "I never find any trouble in selling for cash, at the top of the market, any product of the farm of fine quality. I can always find eager buyers for a fine fat beef, a large healthy turkey, or a

real first class hog. Now, to day I sold a fat cow weighing 1,000 pounds for \$30—three cents per pound. If I had had a car load just like her I could have shipped them to Pennsylvania and netted \$40 apiece for them. And I firmly believe that by the first of May, or by the 15th, at the furthest, a fat beef like the one I have just sold will bring four cents per pound on the Charlotte market. You should go through this county now and see the difficulty that farmers are having in places to buy poor cows for the stall. They are beginning to see what is ahead of us. Many of them are eager to convert their pea vine hay and cotton seed hulls and meal into cow flesh. But there is a great scarcity of pure chassable cows. A man from my town ship just now asked me if I could tell him where he would be able to buy a half dozen poor cows. The indications point to better breeds of beef cattle. We need blooded stock. It does not take any more care and food to fatten a Short horn steer and make him weigh 1,000 pounds at two years old than it does to make one of our common scrub scrubs weigh 800 at three years old."

The writer was particularly impressed with this item, because only a few days before, when traveling in a neighboring county, he had seen evidences of the scarcity of good cattle, and the high prices commanded by first-class stock. Many enterprising farmers are beginning to give attention to stock raising and the prospects for the live stock industry in this State are bright. By the way, what has become of the proposed Wilmington packing house? And of the North Carolina Live Stock Association?

AGRICULTURE.

GREEN MANURING.

Correspondence of The Progressive Farmer.

The object of green manuring is to return to the soil, and thence to the crop, plant food in the form of organized matter. It differs from animal manuring in the fact of the absence of animal intervention in the preparation of this nutrient for the use of the crop it is to nourish. This fact is of great significance, as the necessary result is that the plant food thus furnished is raw material undecomposed by animal action and thus comparatively insoluble and unavailable, though the original constituents of the plant are all present without loss by extraction for animal sustenance.

These two considerations are of the greatest importance and control the practice to the extent of demanding that the crop grown for manure and the one to be supplied with nutriment through it, can seldom be successfully grown the same season, but an intervening season is necessary that decomposition may render the material available.

The material supplied by the green manure is of two kinds, mineral and organic, and is derived from soil and air, as is the case with the content of all plants. It is therefore apparent that the soil gains no mineral matter by the plowing under of a crop, simply thus receiving back again the material taken up by the crop grown. The organic matter is, however, an actual addition to the soil of material taken from the air, and is therefore an actual gain of fertility. Though no mineral matter can be added to the soil by the crop turned under, its store of available plant food is increased by the fact that the crop plowed in may be, and usually is, a deep rooted one which thus brings mineral matter up from the sub-soil penetrated by its roots, which by the turning under of the crop becomes added to the surface soil and thus is made available to crops otherwise unable to utilize it.

These facts lead to the two obvious rules for selecting the crop best adapted to the purpose in view; maximum root action and maximum atmospheric absorption being the objects aimed at.

It so happens that those two properties are combined in one class of plants, namely the legumes—red clover, crimson clover, and field peas are the crops of this family found by experience to possess most advantages. Locality must determine the selection, climate being the controlling factor. The distinctive feature of the leguminous plants giving them their special character, on which the particular value as green manuring crops depends, is the "nodules" or "tubercles" found on their roots and caused by the action of a form of micro organism, the life

function of which is the assimilation of atmospheric nitrogen and the retention of the same in available form in the soil.

The adaptations of each of these three crops and the methods by which the greatest fertilizing benefits are to be secured from their growth are the important considerations.

Red clover does not thrive in the Southern portion of the cotton States. Its chief field of usefulness as a green manuring crop lies in the great winter wheat belt, where the first crop is cut for hay and the second crop and sod are turned under as the chief source of nutriment for the crop of wheat sowed in August or September.

Crimson clover is well adapted to most of the South. It may be sown in August, September or October in orchards or between cotton rows. It makes most of its growth during the late autumn and early spring, it being essentially a cool weather grower, and is then plowed in before the spring crops are planted, which are supplied with nitrogen extracted from the air. It makes an excellent forage crop, though hardly equal to red clover.

The field pea, or "cow pea," however, remains the Southern crop par excellence for the purpose under consideration. It is seldom grown as the sole crop of the soil it occupies, but may follow an earlier crop of corn, cabbage, Irish potatoes or other product. The more common practice is to sow between the rows of corn at the last cultivation, and after the fodder is pulled it will occupy the land.

It produces two different crops, peas and forage, either or both of which may be harvested. In the latter case roots only remain to be plowed under and fertilize the next crop, and the manurial value of the crop is then only about one-quarter what it would be if the entire plant was turned under. Prevention of loss of the nitrogen taken from the air before it can be utilized by a spring crop is easily effected by sowing winter rye or oats after the pea crop is plowed under. Excellent early pasture is thus provided and by plowing the grain crop in before the spring crops are planted, the full value of the green manuring is secured.

Recognizing the fact that the chief value of the leguminous green manuring crops lie in their ability to take nitrogen from the air, the point of most practical importance is, how can this nitrogen absorption be made greatest?

Nitrogen is extracted from the air only in the event of a dearth of this element from other sources. The soil must, therefore, be deficient in nitrogen, and above all things nitrogenous fertilizers must not be applied, if the crop is to secure the greatest possible amount of this essential from the free supply in the atmosphere.

In this same connection, another consideration is all important. Nitrogen, however supplied, is but one of the three constituents of the crop which must be artificially provided. When the supply of either of these materials becomes exhausted or is deficient, plant development is at an end and crop production stops. It therefore appears that the exhaustless supplies of nitrogen of the air are unavailable and useless to the crop unless both phosphoric acid and potash are present in sufficient quantities to unite with the nitrogen to meet the requirements of the crop. It therefore follows that, up to the maximum demand of the crop in question, the more of the two mineral essentials is available, the more nitrogen will be taken from the air to unite with them, and the greater will be the crop production.

Potash is the soil and plant constituent most frequently lacking and most difficult of supply. Soils as a rule come far nearer furnishing the phosphoric acid than the potash required for assimilation with atmospheric nitrogen. It therefore becomes evident that asuring the potash supply is the first requisite toward nitrogen absorption and full benefits from green manuring.

BRYAN TYSON.

Long Leaf, N. C.

A few weeks ago we referred to Prof. B. Irby as "late Agriculturist of the State Experiment Station." We have since learned that Prof. Irby never held this position, and therefore make this explanation in order to "get his story straight."

Firefighters are made in Germany by twisting wood wool into a rope, cutting it into short lengths, and dipping the end of the pieces into melted resin.

PREVENTION OF SOIL WASTE.

An Interesting Paper on an Interesting Subject by the Able Secretary of the N. C. Horticultural Society.

Correspondence of The Progressive Farmer.

We are constantly reading about the building up of soils, but how is it that we hear so little about the maintenance of such soils after time and money has been expended to bring land to a high state of fertility?

There are many ways to prevent soil waste, but it is not a fact that we see no more evidence of such conservation than if we knew nothing whatever about agriculture?

Travel about where you will, and poverty! poverty!! poverty!!! is in view. Gullies go on to larger gullies, hill tops wear down at an alarming rate, beds of streams rise, banks of sand deposit prevent natural drainage and former valuable tracts become filled with water, become sour and unproductive. If heavy washing rains could simply wash down the fine particles and very kindly and evenly deposit them in the valley, we would say "let her wash," but it does not stick to that rule in every instance, and where it does not we must seek to overcome the difficulty and loss. The best fertility goes on down the small streams into larger ones, some is saved but by far the larger amount is lost. Throughout the Piedmont section where the soils are pretty evenly mixed clays and sands, the hilly places suffer irreparable loss. Sand is deposited in large quantities over the most fertile places. One thousand years hence this sand will wear into very fine particles and becoming mixed with the annual growth of vegetable matter will make comparatively fair soil. But can we afford to do in one generation what should be charged up to fifty generations? Hills are destined to wear down, but with all our care to preserve them they will disappear altogether too fast for profitable culture unless under the very best management.

In the Southern States the problem of preservation of fertility of the soil will always be the chief concern of the farmer. It is not so now, but it ought to be and will be, for I believe there are more thousands of dollars wasted in every State in the Union where there is a heavy rainfall from a misunderstanding in this matter than from any other one cause. The South has twice the rainfall of the North, and therefore needs separate and distinct management from that given soils in the North. Top dressing in the fall may be good for Michigan; not so for North Carolina.

Then let us abandon all existing methods and bear in mind that the chief problem is conservatism of fertility. A kind summer climate enables the Southern grower to fill his land with whatever plant food he needs and humus in the soil can be easily made, but it is saving that is the question. The Southern climate reminds me of a rattling good cow possessed of a very bad habit. The cow gives a large pail of milk, but watches her opportunity and just as soon as the last strippings are made and the very froth is trickling down the sides of the pail from its fullness, she kicks it all over and the milk falls with it!

The Southern summer and long season is the pail brimming full of rich milk. The Southern winter is the cow's hind leg that upsets all our plans. The cow's feed that produced the milk is lost; the man's time to milk the cow is lost, and the man's tumble into the mire represents the condition of Southern agriculture. Rise up, brothers, and make the most of your opportunity. The cow is all right, but we must tie her legs. You can save the summer addition of vegetable growth if you will put some crop on the soil to tie it down. Grasses, dried up cow peas, winter oats, rye, wheat, or even weeds, will prevent the soil washing away.

Another essential feature in the maintenance of soil fertility lies in the proper care of all barnyard manure. Scientists tell us there is no waste if good judgment be exercised from any vegetation once produced. According to this a man should value his pile of manure in proportion to the money paid out for all feeding material. If one would pause a moment at this point he would see the urgent need of sheds to cover all the manures made from fall to spring. One of the most valuable sources of plant food is ammonia; manures that are not properly taken care of, and subject to the devastating effects of heavy rains lose

during the winter nearly all the ammonia. Ammonia is the most potent chemical for rapid vegetable growth. It escapes easier than does potash or phosphoric acid; it can be preserved by smothering it—that is, land plaster or even common soil will help smother it, and soil mixed with fresh manure becomes impregnated with ammonia and is in itself a valuable fertilizer.

It is no uncommon thing to see manure so completely washed out by heavy rains that nothing remains but dry bulk fit only for bedding purposes once more.

What is the lesson if such tremendous waste is to continue in the present methods or to provide cover for manure? Some say "I am no worse off than everyone else in this respect; all are careless and I lose only with the rest of mankind." But why continue in this loss? We would not be riding in Pullman coaches to day if George Stephenson had not discovered the use of steam for travelling; some one had to make a start. A farmer I chatted with lately upon this matter said he could not afford to build sheds to store manure under; it could take care of itself in the future as in the past for all he cared. One might as well say he cannot afford to take a rural paper or a city paper or a magazine.

There is a great deal of talk just now about the "coming South" its agricultural possibilities, but soil fertility and its maintenance is the "thorn in the flesh" against the advantages of longer seasons, until we come not only to know how to bring those things about, but exhibit a fixed determination to follow up our knowledge with performance. Then the South will indeed witness the dawn of increasing and substantial prosperity.

THOMAS L. BROWN,
Sec'y N. C. State Horticultural Society,
Greensboro, N. C.

THE VELVET BEAN.

Prof. Massey's Opinion.

In the current issue of Home and Farm, Prof. W. F. Massey writes:

In regard to the much talked about velvet bean we wish to add a few words to what has been said. It is evident from the experiments we have made here that the velvet bean can be grown and ripened in an ordinary season in North Carolina, that it produces an enormous mass of forage of which cattle are very fond. Whether it will finally take the place of the cow pea here is still a question. One thing must be noted, and this is that this bean cannot be used for late planting after harvest, as the cow pea can, and this fact alone will give the cow pea its field in practice as a catch crop after small grains. But the velvet bean is of a more hardy nature than the cow pea and can be sown at least a month earlier than it is safe to sow cow peas. We planted them last spring early in April with perfect success and would have ripened a good crop but the college herd of cows got at our experimental plots and destroyed the whole in a single night. The fact that in this feast no cows were bloated from their eating is another thing in favor of the bean. We hope to experiment further with it, and in the mean time would advise all our readers to go rather slow with the plant, and if they attempt its growth to be sure to plant early enough to give it a chance of ripening seed.

We found that in a season of great moisture like the last the mass of vines was a damage, as all the under part next the ground decayed badly, though the beans were planted four feet by two in the rows. Even at this distance of planting the whole ground was covered waist deep with the mass of vines. Some others were planted along a wire fence and covered it densely with a great mass of foliage.

Those on the fence promised to make a very heavy crop of seeds, had not the cows pulled them all off, not leaving a leaf nor a stem. So the palatability to cattle was settled by our misfortune, and the enormous crop that can be grown must make the plant of great value, for if the whole season can be given them, we know of no plant that will make the same amount per acre. We have not yet had an opportunity to try the curing of them for hay, but have no doubt that they can be cured in the barn in the same way we cure cow peas for hay, or that they will make a valuable material for ensilage. But to get a crop, they must have the entire season from April to frost or nearly so, and can never take the place of the cow pea for late summer sowing.

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