

THE PROGRESSIVE FARMER.

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

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SPRAYING—ITS VALUE AND DANGER.

MR. EDITOR:—Whether the climate of the northern temperate zone is becoming less favorable to the existence of the higher orders of plants, or, whether because of the perfection of modern means of communication between different zones and climes, the lower and parasitic forms of vegetation peculiar to different zones, have become cosmopolitan—certain it is that our important cultivated plants are more affected by disease-producing fungus parasites than formerly. It cannot be said that the vast number of known parasites is due to a more careful study of these organisms, whereby many formerly overlooked species have been brought to view. The time was, even within our own memories, when the loss of a crop of any kind from fungus disease was almost or wholly unknown.

Fortunately for man, whose welfare is so closely bound up with that of the *Graminaceae Solanaceae, Rosaceae and Vitaceae*, the perfection of artificial methods for combating the pests have fairly kept pace with the increased virulence of the pests themselves. In this warfare the salts of copper occupy the place of honor. The philosophy of spraying against noxious fungi depends upon the destructive power of these salts upon absorptive vegetable tissue—not the tissues of parasitic plants merely, but of all plants. The organisms which produce the rots, rusts, mildew and blight of our crops are themselves plants—members of a very low order of the vegetable kingdom. They lack the green coloring matter of the higher order of plants—chlorophyll—by means of which the nobler plants are able to feed upon the gases of the air and the minerals of the soil. Lacking chlorophyll, these fungi, like certain classes among ourselves, toil not, neither do they spin, yet manage to thrive and impose themselves upon their nobler kindred. The copper salts, diluted as they are used for fungicides, are injurious only to absorptive tissues. The foliage and aerial parts of the cultivated plants do not absorb anything but gaseous carbonic acid and they are therefore uninjured by the copper. The larger part of the parasitic tissue is covered and protected by the epidermis of its host and cannot be reached by the poison. It is apparent then that it is impossible to exterminate the fungus preying upon any plant or part of a plant without at the same time destroying the host plant itself. The copper acts beneficially only by destroying the

fungus by which the fungus is spread from plant to plant. The spores cannot as a rule pass from one plant to another except through the air, and it is during this touring period that they must be arrested and executed, like the malefactors they are. By spraying an infected plant we destroy its spores as they issue from the host plant; by spraying a still healthy plant we give it a protective covering of powder, poisonous to the spores of fungi, which kills the spores as they alight upon the leaves and branches. Spraying is therefore always preventive, never curative.

The fungicide most commonly employed in this country is the Bordeaux mixture, which as commonly made contains six pounds of copper sulphate to each 22 gallons. To spray one acre of grapevines once, takes about 66 gallons of this mixture and usually six treatments are required for each season. This gives a total of about 400 gallons per acre, containing about 108 pounds of copper sulphate. All of this copper eventually finds its way into the soil. As we have seen, copper salts are a deadly poison to all absorptive plant tissues, and therefore to the roots of cultivated plants. Is there not danger then that the accumulation of this substance in the soil of our gardens and orchards, if persisted in for a series of years, may eventually affect the fertility of the soil? There is very great danger. And let it be understood that when once the soil is sterilized by this poison, not all the guano on the coast of Peru can ever restore it to its former state, or make it fit to bear one blade of grass.

The possible danger of using such poisons has already occasioned considerable alarm in Europe. It came up for discussion at the last meeting of the German association of naturalists. It was shown that copper sulphate in the soil soon becomes copper oxide, which is practically insoluble and remains in the upper stratum of the soil. The sulphuric acid in the copper sulphate combines with the potash and lime in the soil and with them forms more or less soluble compounds which are washed into the drains or so far below the reach of most plants as to be practically lost. Its deleterious action is therefore twofold: It destroys the young roots of plants and causes the useful potash and lime in the soil to leach away. When lime is added to the copper before it is sprayed, the baneful effect of the latter upon the potash and lime in the soil is largely prevented, but its evil effect upon the growing plant roots still remains. The horticulturist must therefore bear in mind that the fungicides he uses are by no means friends to be depended upon without limit. They are necessary evils, to be used with caution and the greatest economy. By hygienic precautions the amount of copper salts used can be greatly decreased.

The quantity of copper which suffices to make a liquid destructive to absorptive plant tissues is surprisingly small. It was recently noticed at German seed-control stations, that distilled water seemed to be poisonous to young plantlets grown in the process of testing the vitality of seed. After much experimentation the trouble was found to be caused by the almost infinitesimal quantity of copper dissolved by the water in passing through a copper still. From this fact we should judge that the amount of copper used in the Bordeaux mixture is much larger than is necessary. In fact, European experiments—especially those at the St. Michael Experiment Station in the Tyrol—show that a very much weaker mixture will often give as good results. At this station the Bordeaux mixture was made with copper sulphate varying from two per cent. to one-fourth per cent., that is, with from 4.4 pounds to one-half pound of copper sulphate to twenty-six and one-half gallons of water. The weakest form gave as good results as the strongest, as is well known to grape-growers and others who use the Bordeaux mixture, it is usually all washed off by the first rain. Since we have seen that the presence of a mere trace, if it be well diffused, is sufficient to protect the foliage from infection, the safest way would seem to be to use a weak solution and put it on in the finest possible spray, just enough to wet the foliage, with repetition of the treatment as often as the rain washes the powder off. Another precaution which suggests itself is to add to the mixture some substance which will cause it to adhere better to the foliage.

I am now using in vineyard practice

a mixture containing four pounds of copper sulphate, four pound of fresh lime and one-fourth pint of Lepage's liquid glue to each 25 gallons of water. This has so far given very good results, outlasting several heavy washings. I have also experimented with a mixture containing, instead of glue, one-half pound of hard soap to the 25 gallons of mixture. The lime decomposes the soap, forming an insoluble lime soap which causes the copper to adhere well to the foliage. But the lime, troublesome to spray in any case, forms clots with the soap which are very difficult to get through the nozzle. The glue is therefore preferable. The Burgundy mixture, consisting of 4.4 pounds copper sulphate, 5.5 pounds soda carbonate, one-half pound hard soap to each 26½ gallons of water, has in Germany given better results against Peronospora of the vine and potato blight than the Bordeaux has. This mixture adheres extremely well to the foliage. The ammoniacal carbonate of copper adheres better, is easiest to prepare and apply, and contains less copper than any other efficient fungicide. The great advantage of the Bordeaux mixture is that with it Paris green or London purple may be used, thus forming a compound insecto-fungicide. Arsenites cannot safely be used with any mixture or solution containing soda carbonate or ammonia, for these substances dissolve the arsenic which then scorches the foliage.

When the ammoniacal copper carbonate solution is wanted, it will be more convenient to use the dry ammonia carbonate instead of the liquid ammonia.—Gerald McCarthy.

THE LAST RESORT.

BOGUE, Carteret Co., N. C., June 6, 1891.

MR. EDITOR:—Let us stop, inquire and reason together, soberly and intellectually, the cause that we find men as they are at this time, or we are a fallen race. We find our pathway more cloudy. We say that man is a fallen creature, and did not come as he now is from the pure hand. When we said man was not wicked, but clever, that a majority were not depraved, it seemed to sound sweetly, and harmonize with all our companions, when not disputing on things that were agreeable. It was so with Potter, while moulding the clay so long as it was pliable. We see letters denouncing Col. Polk, and that class, for opinions, writing letters, &c. We heard a man on our church yard denouncing the Alliance (the only man). He spoke of them as a class of politicians. He pronounced them utterly destitute of principle. He declared them dishonest in everything. Becoming excited, would mingle curses with his expressions of contempt; their zeal he called either fanaticism or hypocrisy, often both. Such epithets could do no harm, because they show the malice and spleen of the party or parties, who utter them. They are to be pitied for nervous weakness and for the want of proper information. The third party makes them tired. No wonder. There is one thing I do know, and that is, she is well developed, strong and robust, and that the sectional clogs, with every other impediment, will be removed.

The women, God bless them forever, with the men shoulder to shoulder, will shoulder a hand-stick, and with one long pull, and a pull altogether, will move them without much trouble. The very impediment that has been impossible for the old parties to handle for twenty-five years, and will continue until time shall be no more under sectional lines. The reason caused by the war between the States. A solid South and a solid North, what a spectacle! One pulling one way and the other another. Under such circumstances reason teaches us these logs will never be removed.

Now I ask every intelligent being on this continent: Is it not practical sense to compromise, to say the least of it? One cannot and the other will not. You see we have all been like the dog in the manger. So if that feeling has been removed for more charitable blessings, we are bound to admit in this court of justice, that the country has been wonderfully blessed, and that prosperity will dawn upon us in the near future.

In conclusion, we say to the Ohio boys, beat John Sherman; let him go like Ingalls. You have nothing to lose, but everything to gain. No man can make a million of dollars in so short a life-time, legitimately. Respectfully,
R. W. HUMPHREY.

REPLY TO BRO. CADE'S STRICTURES ON THE PRESBYTERIANS.

MR. EDITOR:—In your issue of May 19th you have, in the editorial columns, some very severe strictures on the course pursued by the Presbyterian church in its dealing with Dr. Briggs, of Union Theological Seminary, N. Y. The following week I dropped you a postal asking you kindly to please look over the case anew and see whether you had not spoken unadvisedly in the matter. As yet I have received no reply or recognition, unless it is to be found in the two recent lectures by Rev. Thos. Dixon on the same subject. In the editorial you expressed amazement that Christian people should act as the Presbyterian church had done. Our time-honored confession of faith was stigmatized as "cast iron" and fit only to be "thrown away." Dr. Briggs' views were euphemistically styled "liberal." The Presbyterian church was dubbed a "strangler of free discussion." These are serious charges to be brought against a body of Christians, and ought not to be done inconsiderately. As the charge has appeared in the columns of THE PROGRESSIVE FARMER, I hope the following article may also be admitted:

Dr. Briggs was installed Professor of Biblical Theology in Union Theological Seminary, N. Y., last January. At his induction into office he made the following solemn promise and statement of his belief:

"I believe the Scriptures of the Old and New Testament to be the Word of God the only infallible rule of faith and practice; and I do now, in the presence of God and the Directors of this Seminary, solemnly and sincerely receive and adopt the Westminster Confession of Faith as containing the system of doctrine taught in the Holy Scriptures. I do also, in like manner, approve the Presbyterian Form of Government, and I do solemnly promise that I will not teach or inculcate anything which shall appear to me to be subversive of said system of doctrine, or of the principles of said form of government so long as I shall continue to be a professor in the Seminary." (Italics mine.)

On this occasion he delivered an inaugural address. In this address he explicitly states that there are three fountains of divine authority—the Bible, the Church and Reason—and that men can find salvation by any of them.

As to the infallibility of the Bible, he says: "There are errors in the Bible which cannot be explained away." The Westminster Confession of Faith says of the death of believers: "The souls of the righteous being then (at death) made perfect in holiness are received into the highest where they behold the face of God in light and glory waiting for the full redemption of their bodies." This Dr. Briggs emphatically denies. With reference also to the decrees Dr. Briggs is at variance with the Scriptures as interpreted by the confession.

Now the Presbyterian church, honestly trying to obey the Saviour's command to preach the Gospel, has established seminaries, of which Union Seminary is one. She believes the Bible is God's Word and the only infallible rule of faith and practice. She wants that taught at the Seminary, and requires her professors to solemnly promise that they will not teach to the contrary. Dr. Briggs makes that promise and clearly violates it.

The Presbyterian church then says to him, you are not teaching what we believe to these young men, and we cannot approve of your teaching for us any longer. And because she doesn't want her young ministers trained in Dr. Briggs' belief, the editor of THE PROGRESSIVE FARMER sends into many Presbyterian homes an editorial expressing amazement at the Presbyterian church for "strangling free discussion," her belief about the Bible should be thrown away and Dr. Briggs' accepted (for there is no other alternative) in its place; and then we are told that the final triumph of Christianity may be expected.

I am County Lecturer in the Alliance and feel a deep interest in its welfare and believe I have a right to enter a solemn protest against said editorial. This whole matter, too, takes on a graver aspect when we see this editorial followed by two lectures from Rev. Thos. Dixon, Jr., on the same subject—one on June 2d, the other June 9th—in which there is such reckless disregard of justice that it does seem they should not have been sent out without some comment. Amongst a dozen mis-statements is the emphatic assertion that all this

cry against Dr. Briggs is the result of "disappointed ambitions, narrow jealousies and envying and bitter personalities."

And these lectures, coming after the editorial in THE PROGRESSIVE FARMER, without any comment, receives to a great extent the endorsement of the editor. The General Assembly of the Presbyterian Church, disapproved of the act of the Board of Trustees installing Dr. B. They did so by a vote of 440 to 60. It was as able and conscientious a body of men as ever met in a religious assemblage in America, and not a lot of disappointed ecclesiastical office-seekers. The statement is absolutely false. The question was not whether there was to be a creed taught at Union Seminary, but whether it should be that of Dr. B. or of the Presbyterian Church. As she built the Seminary, endowed it, (done I mean by those of her faith) as she is responsible for what is taught there, and as she requires of her professors solemnly to promise to teach her creed, it seems to me that the editor of THE PROGRESSIVE FARMER has arraigned her too severely for her act.

This crying out against creeds comes strangely too from an editor of an organ of the Farmers' Alliance. As Alliancemen we propose to have a creed—the Ocala platform—and have men swear to support it. If they don't, we say they shall not represent us. That is just what the Presbyterian Church says.

If I am not mistaken, Senator Vance had to agree to support the Alliance creed in the U. S. Senate, and THE PROGRESSIVE FARMER was forward in the movement requiring it of him. His terms of obligation were not more solemn or binding than those of Dr. B. Suppose now he should violate his obligations, and turn upon THE PROGRESSIVE FARMER, and say, "You surely do not propose to strangle free political discussion, do you? Party demands, poked at representatives means you want no more light upon any political question." Would that be right, after his promise? There is nothing, I believe, that would please the enemies of true religion more than the tone of your editorial and Mr. Dixon's two lectures.

As for the hindrances to the final triumph of Christianity spoken of in the editorial, I will say that one of them, and no small one, is the spirit displayed, alas! too frequently by men in high places in the church—men retaining, or striving to retain, ecclesiastical office in violation of solemn obligations, and then, too, frequently they are defended in such course of conduct by those who ought to have discounted it. Those who defend it lead others to think that they think such conduct is right.

If the creed of the Presbyterian Church is cast-iron, Dr. B. knew it full well when he was ordained. He renewed solemnly his promise when he was installed that he would abide by it or quit; now he could quite easily enough. He knew it, and the editor of THE PROGRESSIVE FARMER ought to have known it. He could be to-day a member of the 19th Century Club and a full-fledged infidel, and nobody would strangle him any more than any of the other members of that Club. They are not complaining of strangulation. But when there, the church would not be responsible for his utterances. She is now, and conscientiously doesn't believe she ought to lend her mighty influence to the propagation of doctrines that she honestly believes would do great harm. This is a great big free country, and Dr. Briggs can find plenty of room outside of the Presbyterian Church to teach what he pleases. The Presbyterian Church has a right to say she will not endorse him, and ought to be allowed to do so without being arraigned as she has been in THE PROGRESSIVE FARMER. If this right is not allowed her, I hope replies will always be in order.

JNO. G. ANDERSON.
Harrisburg, N. C.
[We frankly grant space to Rev. Mr. Anderson for his article in defense of his church. We are pained that any defense of any church, through our columns should be made necessary, especially as against any attack or charges made in this paper.

It is no part of the mission of this paper to assail or intermeddle with churches or religious bodies, but since its course in regard to the celebrated case of Dr. Briggs has aggrieved a large number of Presbyterians, it is just and fair and right that Mr. Anderson be heard in their defense. We profoundly regret it, and promise that

henceforth this paper will be found only in the field where it legitimately belongs. It is due THE PROGRESSIVE FARMER to say that the articles complained of were published when the late editor, Mr. Cade, was in charge.—EDITOR PROGRESSIVE FARMER.]

WRIGHT IN THE FIELD.

BALDWIN, Ashe Co., N. C., June 25, 1891.

MR. EDITOR:—As I have seen nothing from Old Field Alliance, I write. Although we are a little still, we aim to get there Eli. We have some 35 to 40 male members and the Lord knows how many females, and the most of us think we are good Alliancemen, and that in deed and in truth. We are glad to know that the great and grand organization is meeting with such unparalleled success all over our land and country, and we say God speed the time when she may be successful in accomplishing all of her grand and noble aims, and the oppressed and impoverished farmer may breathe more freely the pure, delicious air of our beloved America.

Well I would not omit telling you and the many readers of your great paper of the visit and speech of Bro. C. C. Wright, our Assistant District Lecturer. His appointment was here last Monday, June 23d, and before the hour for speaking had arrived many persons were on the ground anxiously waiting for his approach, and when he drove up he seemed to make a good appearance. Some in the crowd were heard in low tones to say, "He's a sharp-looking fellow, and I'll bet he can tell it and he's a blamed good looking chap," and so on.

And I am glad to add that they were judging about right. His eloquent, pithy and interesting speech of over an hour seemed to convince his cheerful audience beyond all doubt that C. C. Wright is the right man in the right place and I am satisfied that his labors in our county will to some extent animate our members with new life and vigor and will result in propagating our grand aims and purposes more extensively in our county. I have been all over this county trying to do something in this direction. Many places where I have been, and in fact nearly all, the people seem determined for success, and I am hopeful that our mountain people will stay in the fight until the final victory is won and we can feel ourselves a free and a prosperous people. Although I visited a few places where I had appointments where if I spoke nobody knows it; if I made any impression on anybody I have never found it out. If I made any mistakes they were not corrected, for I tell you, brother, nobody was there, and I don't guess I strained my lungs much speaking to the empty walls of such places; and in conversation with the people of some of these places led me to believe one had as well sing Psalms to a dead mule as to preach Alliance doctrine to them, for they had backslidden and made shipwrecks of their faith. The fact of it is they had been influenced by our enemy and turned out of the good way and were opposing the Alliance most heartily, yet they had once been members.

Now I am glad to say that such places are very few, yet there are some. I know whereof I speak, and I would say to the brethren everywhere let us watch as well as pray. Our enemy is powerful, as wise as serpents and they pretend to be as harmless as doves, therefore let us be vigilant and stand together and most assuredly we will conquer by and by.

With best wishes for the future success of your valuable paper and its thousands of anxious readers,
Fraternally,
T. J. HOUCKE.

THE RIGHT THING DONE, AND APPROVED.

PLEASANT HILL ALLIANCE, No. 73, Columbus Co., N. C., June 6, '91.
WHEREAS, The fundamental principles of our order admonishes us to define our position timely on all matters that obstruct the betterment of our people morally, socially and financially; and against all monopoly, especially that most formidable one, the whiskey traffic.
Resolved, By Pleasant Hill Alliance, No. 73, that we, in a non-partisan way, do extend our hearty thanks and cooperation to that large and respectable number of our township magistrates who, as public benefactors, with courage equal to their conviction, united on the first Monday in June in their reasonable petition to the County Board of Commissioners against any further liquor license in Columbus county.
J. J. THOMPSON, Sec'y.