POOR DOCUMENT

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THE MANURE QUESTION. A HOMEMADE SUBSOILER. A Simple, Lucid and Interesting Ex-

Implement to Follow the Break-ing Plow In Clay Subsoil.

A Rural New Yorker correspondent sends to that journal a plan for making an excellent little single horse subsoiler that works to perfection and need not cost more than \$2.50. He worked the implement out thus in his home shop:

I first made a model, this being cut from thin wood, and, as good fortune favored me, I secured just the right shape the first trial. The beam and standard are formed of one bar of wrought iron 6 feet long and five-eighths by 2¼ inches in size, which is strong





enough for a draft horse. The share, or point, is of a peculiar shape, and is made of a new, large, steel "bull tongue" cultivator "shovel" three inches wide. The "bull tongue" is cut as shown in the figure, leaving a long, plercing, wedgelike point. The three-fourth inch incisions at a a, allow the upper half of the blade to be bent or rolled backward, forming a long, deep diminish the bulk of the pile. While groove that clamps very securely around the standard of the plow, where it is firmly bolted. The long, tapering point, when the wheel is adjusted for subsoiling to the desired depth, lies perfectly flat in its course through the soil-the curvature of the upper half of the blade being quite flicient to lift, "ground mole fashion," the entire bottom of the furrow, while the passage of the standard, through the midst of this upheaval, breaks and pulverizes the hitherto hard, compact subsoil in a very thorough and satisfactory manner. The handles are those of an ordinary cultivator, and the wheel, seven inches in diameter, was purchased from a scrap



position of Its Chemistry. Kansas experiment station has just In those portions of the manure completed the analyses upon one of a which are accessible to the air one series of digestion experiments with alclass of bacteria live and breed in falfa. In this experiment hay was enormous numbers. They feed on the used which was cut when in full bloom oxygen of the air and the nitrogenous and was fed to a 3-year-old grade Hereportion of the manure and in their exford steer. The result of the analyses crements give off large quantities of show that the air dry hay contained nitrates, the latter being the direct digestible nutrients as follows: Crude products of the oxidation of nitrogeprotein, 10.43 per cent (consisting of albuminoids, 7.86 per cent; amids nous organic matter anywhere, whether in the bodies of these bacteria or. not. 2.57 per cent); fat, 0.69 per cent; crude

These nitrates, being very soluble in fiber, 15.99 per cent; carbohydrates, water, drain down into the interior of 28.18 per cent; total digestible nutrithe manure heap, just as they drain ents, 55.29 per cent. Let us compare through the soil. But instead of all these last figures with those represent going off in the drainage water and becoming lost, as they often do in the soil, they are chiefly lost by an entire-

ly different process. In the interior of the heap, shut away from the air, these nitrates fall prey to another class of bacteria known as "nitrate destroyers." They completely undo the work of the other bacteria, or "nitrate formers." The "nitrate destroyers" live on the nonnitrogenous constituents of the straw and leaves and the oxygen of the nitrates. This liberates the nitrogen in the form of gas, which escapes into the air and is lost to the farmer. The process also consumes the nitrogenous portion, which is chiefly the remainder of the litter. It is formed into water and carbonic acid gas, which escape into the air and thus

ADEDE

the "nitrate formers" live near the surface of the manure and require air for their work, the "nitrate destroyers" live from the air and do not need it. They are dependent, however, or ALFALFA. food of a certain kind and must have ing the total digestible nutrients contained in some of our most common plenty of it, otherwise they become infeeds used for dry roughage. Millet active and can do no damage, though contains 57.6 per cent; oat hay, 52.2 millions of them may exist in the interior of the manure pile. One of their per cent; orchard grass hay, 48.2 per principal foods, the nonnitrogenous cent; timothy hay, 48 per cent; prairie by a third class of bacteria, which oat straw, 43.9 per cent; wheat straw, 39.2 per cent, and corn fodder, causes the rotting of the litter. Nitrates are also indispensable for their nour- 35.8 per cent. We find that only one of ishment. If, therefore, they are de- the ten feeds named is equal to or exprived of either one of these constitu- ceeds alfalfa in its total content of digestible nutrients, while the larger part of them are far below it. This is not a will be so intermingled with those of ents of their diet, they either die or iron man for 15 cents. There being at least beco fair measure of its feeding value, how The work of the "nitrate formers" ever, unless we also take into account is beneficial. It converts organic nitrogen into nitrate, a most available the composition of these nutrients. As form of plant food. Half rotted maa rule it costs much more to produce feeds rich in protein than it does those nure contains nitrogen largely in this form. The work of "nitrate destroy- rich in carbohydrates, and consequent ers" is destructive. It removes the ly of two feeds containing an equal amount of digestible nutrients the one soluble nitrates from the manure. It containing the most protein is the most converts half rotted manure into well rotted manure. In this way the differvaluable. ent effects produced by manure in its Comparing alfalfa in this respect three different conditions are explainwith the above named feeds we find that it ranks far ahead of the richest ed. The nitrogen in fresh manure is of them. One hundred pounds of allargely organic and not immeditely available. It therefore has a slower falfa hay contains 11.3 pounds more digestible matter than the same amount and less effect than half rotted manure. The nitrogen in half rotted maof red clover hay and 11/2 times as much protein. It contains only 2.3-pounds less of total digestible nutrinure is largely in the form of nitrates, and this is available. The nitrogen in well rotted manure has all been conents than the same amount of millet verted into nitrate also and was once hay and almost 21/2 times as much didigestible protein. It contains 21/2 times available, but has subsequently been as much digestible protein as oat hay, lost in the air. This is why the well 3 times as much as prairie hay, more rotted condition is the least valuable than 4 times as much as sorghum hay, of the three. 5 times as much as corn fodder, 61/2 In handling manure the farmer times as much as oat straw and 13 should strive to place it at the disposition of the growing crop just at that times as much as wheat straw. In feeding value alfalfa hay not only moment when the most nitrate has been formed and before any has been ranks high above all other feeds used for roughage, but it is well up among destroyed. The most favorable conditions are obtained when fresh manure the more concentrated feeds. One hundred pounds of it contains 3.3 is packed as tightly as possible away pounds more of total digestible nufrom the air and kept in that condition trients than wheat bran and almost as till half rotted and then plowed under much protein. It is richer in digestible just before planting or sowing. Under these circumstances, although the protein than wheat, corn, oats, rye, barley, Kaffir corn or sorghum seed. third class of bacteria have in the rot-Its digestible nutrients have a nutriting of the litter made soluble food of tive ratio of 1 to 4.4. There are only a one kind for the "nitrate destroyers," few feeds, such as wheat hran, linseed the latter have been deprived of their meal, cotton seed meal and soy beans other necessary food, the nitrates, for that furnish as narrow a sutritive ranone could be formed in the tightly tio as this. Alfalfa hay, therefore, is packed mass, and they have remained an ideal feed to use in balanced raharmless. But the heap has become tions and is especially valuable to comhalf rotted without them. After the bine with corn as a ration for fatten manure is plowed in, the "nitrogen ing steers, since it furnishes all the formers," now having plenty of air, roughage necessary and is also a cheap rapidly produce nitrates, which are besource of protein. It is an ideal dairy yond the reach of the destroyers; for feed, furnishing almost the exact nu by this time all their soluble nonnitrogtritive ratio required for the highest enous food has been decomposed and yields of milk. Its value as a feed for the Paul Rose, Osage and Netted Gem. has gone into the air, leaving them to die. The growing plants in the meanhogs has been shown in results previ-

Each Day's Growth of a Weed Among Hoed Crops Lessens the Yield. It would be difficult for most farmers to calculate how great is the loss from the prevalence of weeds in crops. In a season when dry weather prevails these losses are comparatively small, though even then the weeds take water from the soil, which is not all re-

LOSSES FROM WEEDS.

turned when they are uprooted and buried in it. The weed that is buried is surrounded by air spaces, keeping the soil more porous than it otherwise would be, and therefore drying it out faster. The case is still worse as regards the fertility that the weed has taken. It was originally entirely soluble, but the weed has to ferment and be resolved into vegetable mold before it can be put in the same soluble condition. Yet, says American Cultivator, we have known farmers to delay cultivation of hoed crops so as to have more grass and weeds to be plowed un-

It is often said that weeds are a preventive of good farming; that there would be much less cultivation of hoed crops if it were not that the growth of weeds made it necessary. Yet where the cultivator is kept going all through the season, so often as to prevent any weed from reaching the urface, the weed killed as quickly as it sprouted has done the soil more good and less harm than it could do at any subsequent stage of its growth. At this early period about all the plant substance has been directly furnished from the swelling and decomposition of the seed in germination. At this time the carbonic acid gas which the seed gives off when it germinates makes its plant food more soluble than it ever can be after the plant puts forth roots and begins to draw from the soil. Finely powdered malt has been used as a ferfilizer. When it has been applied in contact with seed grain of any kind, it has produced remark-

able results, though it is too expensive a fertilizer to be used on a very large scale. But the ordinary weed seed is much smaller and has far less fertilizing material in it than has a grain of barley.

It is the peculiarity of most weeds that most of their growth is taken directly from the soil, and that both it and the moisture to make the plant food soluble are needed by growing crops. Each day's growth of a weed among hoed crops lessens the yield.



A NEAT PLANT SPRAYER. Just What Is Wanted In the Way of Greenhouse Nossle.

Several years ago, while conducting experiments with roses under glass with Mr. Robert Miller in Washington, the attention of Professor B. T. Galloway of the department of agriculture was called to the necessity of a small and cheap apparatus that could be used in syringing plants with water. During

the winter and at other times syringing plants under glass is absolutely necessary, and the chief aim in such work is to apply the minimum amount of water with the maximum amount of force. In small establishments hand syringes are used, but where the work is extensive they are, of course, out of the

question. Where a pressure of 80 to 40 pounds is available the practice of using the finger on the open end of an ordinary three-quarter inch hose is generally followed, but this is not always satisfactory, for frequently new men are



TIP AND GREENHOUSE NOZZLE. brought into service, and it takes them some time to learn just how to manage the hose so as to apply a small amount of water. To overcome this difficulty Mr. Miller devised a number of nozzles, which, in connection with the suggestions of Professor Galloway, finally developed into the form shown in the cut. The nozzle consists of a casting turned to the desired length and flattened at the end. Through this flattened end a narrow slit is made. It is important to have this opening absolutely

is intended.

the bed.

PROTEIN AND MILK. What Is Required In Feeding Dairy

3

Cows. The scientists, says Hoard's Dairyman, tell us that it requires a daily allowance of seven-tenths of a pound of protein for the simple maintenance of 1,000 pound animal. In 20 pounds of milk there should be about eighttenths of a pound of casein, and hence. without allowance for the inevitable loss that must occur in changing the protein of the feed into the casein of the milk, we have a demand for oneand one-half pounds of digestible

protein. If the cow is expected to give more milk, she must have more protein It is largely immaterial to the com

where the protein comes from, provided she has the digestive capacity to eliminate it from the feed. We can find it in 25 pounds of clover hay, but only half of it in the same amount of timothy hay. One hundred and twenty-five pounds of oat straw would furnish one and one-half pounds of digestible protein, but it would take a good deal of other feed to enable the cow to digest so much straw.

We do not know any reason why soja beans, field peas and even alfalfa could not be profitably produced in New Hampshire. There is, in our minds, more doubt as to crimson clover. This must be sown in the late summer or early autumn, and it is questionable whether it would survive a New England winter. If it will and is cut early, it will make excellent hay. The danger with crimson clover lies in letting the heads become ripe or nearly so. Too little is known of vetches, least by us, to justify the putting forth of suggestions. Things of this sort may very likely be tried in an experimental way for a year or two and hus their adaptability to the peculiar local conditions determin

The question as to which is the better cow for the farmer has attached to it irrelevant conditions. The cow whose milking qualities have been properly developed, if of good consti-tution and adapted to the conditions for grazing, etc., in the locality, is always the better cow. There is no style of breeding, bringing up or care that will give us a cow that can transmute carbohydrates into casein. As well attempt to make sugar from salt. A balanced ration does not necessarily im-ply the use of concentrated feeds, but they are recommended because it is true throughout, otherwise the water difficult in any other way to supply the cow with sufficient material to enable as it issues from the nozzle will be

some quite heavy forging upon the beam in bending it to the desired shape and in cutting the share down to the proper form, it will be necessary to call upon the blacksmith for that part of the operation.

To those unfamiliar with the practice of subsoiling it may be well to say that this implement is planned to follow the breaking plow, tearing up and mellowing the bottom of the furrow to the depth of about eight inches Thus it will be plain that, if the breaking plow be turning to the depth of eight inches, the subsoiler stirs up another eight inches deeper, leaving the plant or seed bed pulverized to the depth of 16 inches.

A Potato of Good Yield and Quality. The Joseph potato has received favorable mention from some of the New England potato growers. American Cultivator illustrates it from an ex-



THE JOSEPH POTATO.

cellent photograph of the potato as raised by a Vermont farmer and says: It is well to notice the size, shape and general appearance of the potato. The color of the skin is a light pink, and the flesh is white. The tuber is invariably free from core. It never has shown an inclination to grow hubbly or unshapely. It yields well, is of wonderful vigor and is of excellent quality for a table potato.

Stat:

Sugar Beet Leaves I notice that there is a good deal said in the press in regard to the value of beet leaves for feed, and that they are more or less fed to stock of different kinds in sections where farmers grow beets for factories. I hardly need dwell on the value of beet leaves for food. All who have had any experience with them will readily concede their nutritive value. If free from dirt they would be an available addition to the list of silo plants, yet I cannot help feeling that the ones who have given this subject most attention are right when they assert that these leaves are more valuable left on the ground in drainage. the fields as a fertilizer, inasmuch as they contain exactly the right elements that the soil needs, and in available form. It is all very well to assert that they can be taken back after being fed in the form of barnyard manure. The trouble is that they are not likely to go back where they are needed-and that is, where they came

ously published by this station. If fresh manure is plowed in di-Keep Young Hogs Growing. rectly before seeding, a poor result is There is an impression among farm

New Blood.

They have all gone across the water

for new blood. Never before in the

history of American sheep breeding

baye so many large importations been

obtained, for the nitrates are not ers that hogs in summer at pasture formed until after the plants have can get enough with the swill from the passed their growing period, and they house and what they can get in the consequently starve. As might be fields. This was all right so long as supposed, winter crops fare better skimmilk, one of the best foods for than spring crops with this proceeding. growth, was part of the swill and un-By plowing in fresh manure several eaten refuse from the table was months before seeding a much better also thrown in. But in many places result is obtained, because the nitrates the skimmilk is now sold in are on hand and are being formed at form, while a better use for table refthe growing period of the crops. Exuse is found in giving it to the poulperience has abundantly proved that try. So the pig is starved in summer, it is better to plow manure into the soil which is the time he ought to grow the and allow it to lie there rather than in fattest, and is the poorest preparation the pile. Whether it is better to leave for the heavy corn feeding that will manure spread upon the surface of begin in September and continue until the land, rather than to plow it in or the pig is turned over to the butcher. leave it in the pile, depends chiefly on A half starved animal loses the power the amount of loss caused by surface of digesting hearty food, for the stomach, like every other organ of the body, needs to have something to do

The foregoing paragraphs are ex tracted from an article which appears to keep in good health and strength .to fill a want-that of inexperienced Boston Cultivator. farmers and practical farmers who have scant time for the literature of their vocation, for a brief, compact and lucid presentation of the manure question. The article is modestly appended to bulletin No. 58 of the Hatch (Mass.) station as "notes" on made in one year.-American Sheep from. We should leave the beet leaves on the ground as a fertilizer and feed the proper handling of barnyard ma-the pulp, says C. F. Saylor. Breeder. the pulp, says C. F. Saylor.

time absorb the nitrates.

valuable crops that one cannot be de stroyed without uprooting the other. A little care in destroying the weeds while small will save much labor later, besides the inevitable shrinkage of the crop among which the weeds have een allowed to grow.

A Farm Convenience. Scandinavian farmers in the north

west have preserved a number of old country devices for buildings and ools. some which gain fa vor with friends and neighbors of those who pu them into prac tice. A drawing of one of these sent to The Ohio Farmer represents two half doors of the common type. The lower one carries near the top a tool box, the usefulness of which goes without ques-

to use a lance 18 inches long, made of tion, as it is ala piece of one-half inch brass pipe This increases the reach and enable HANDY BARN DOOR. ways easily accessible both from without and from the operator to place the water to betthe inside of the barn. Whatever artiter advantage on plants which under cles are commonly placed in the winordinary conditions would be beyond dows, on dusty shelves, on crossbeams arm's length. The apparatus can be and in odd corners should find their made for 50 cents, and will be found a way into the door box, so that one useful instrument wherever there is might always know where to find things instead of hunting them up and sufficient water pressure to insure a proper amount of force. losing one's time and temper.

Fine Cantaloupes. Rural New Yorker tells that Mr.

Hale of Georgia, of peach orchard liam Belt, Haverland and Clyde, Cresfame, has 300 acres of cantaloupes on cent and Rio, each a rival to its mat his farm, which were planted to help in productiveness, season and other out the shortage caused by the failure qualities, it would seem as if the acm of the peach crop. His New York of perfection had been reached in straw berry development. The highest type of all, the Marshall, needs no mate, and thus brings within the reach of the amateur a single variety embracing all the desirable qualities of a strawberry.

In some sections late sowings of peas during the first three weeks of August do well, Nott's Excelsior being Country Gentleman.

the greater covering to the ground by surest way to get rid of the plantain pest, says American Cultivator.

but good reports are sent out from Michigan, Minnesota, the Dakotas, Nebraska and Kansas, while conditions have changed for the better in the middle and New England states. Advices from leading potato sections of the middle and eastern states add further like testimony to this general sit-

and the second second

ustion.

broken up into streams. As the her to utilize her m come from the factory they are not algans to their normal and economical ways satisfactory, and it has been occapacity. casionally found necessary to smooth

Experiments With Dairy Cows. the opening with a narrow, flat file. A Professor Brandt of Germany comfew tests, however, will soon show just ducted three experiments with light what is wanted in the way of a spray, and heavy dairy cows, each lasting which should consist of a flattened four weeks, the second commencing mass of water, about the shape of an ordinary gas flame, but, of course, 70 days after the close of the first, and very much larger. At a distance of two the third year after the beginning of to three feet from the end of the tip the the first. Thirty of the heaviest milkers in the herd were separated into lots spray breaks up into innumerable small drops, but with force enough to effect- of five cows each, according to live ively answer the purpose for which it weight. The cows were kept under similar conditions to feed and care

The spray tip proper is attached to a during the trial, none being bred after brass fitting, which in turn screws on the beginning of the experiment. The to the end of a three-quarter inch hose. average weight of the heavy cows The apparatus is very effective for spraying roses, as it readily serves to keep the leaves in a thoroughly healthy

condition and at the same time wets the beds but little. It is also very use-The milk of the small cows is richer in fat than that of the large ones. Large cows eat a greater amount of ful for violets, as with a pressure of 85

feed than small cows; per 1,000 pounds to 40 pounds the leaves of the plant can live weight they eat less. be readily turned over and thoroughly Small cows produce less milk than washed without soaking the crowns and

large cows, absolutely and relatively. When in thin flesh, small cows may In spraying some plants, particularly produce more per 1,000 pounds gross violets, it has been found advantageous weight than large cows.

Large farrow cows are more persistent milkers; on the other hand, small cows show a greater tendency to fatten on the same feed, with a decrease in the milk flow.

The loss in selling ten of the large cows amounted to five guilden per head on the average, after having been kept nearly a year, while the loss for ten small cows was 12 guilden per head.-Feeds and Feeding.

Salting Cows In Summer.

When one has such pairs as Bubach and Brandywine, Enhance and Wil-The best way to salt cows is to leaver some rock salt under a covered place where the stock can lick it at will, They will then never get more than is good for them, but will go up and lick a small quantity once every day or two. We know farmers who make it their practice to salt cows every Sun-day morning. It is not breaking the Sabbath to any serious extent, and the owner of the stock has the pleasure of except a cosmopolitan habit. I have not yet succeeded with it on my light soil, noting its condition and whether there are any animals in the lot that appear and it seems easier to grow bushels of William Belt and Clyde than quarts of unthrifty. We have often salted the cows Sunday morning by throwing fine salt thinly over grass while it was Marshall, but when one has grown to perfection the mammoth Marshall with covered with morning dew. Some of the salt might be lost, but we thought its dark purple flesh and delightful from the way the grass was eaten that quality all other successes are forgotten, says L. B. Pierce of Ohio in The not much would be wasted that way. When we salted sheep by throwing salt on wet grass, they ate the grass Fall Planting of Sweet Peas. down to the root .- Boston Cultivato

Quality Counts.

Dairymen should not forget that the discrimination between choice and ordinary grades of butter is becoming: more clearly and sharply defined each year. It is only the best that is always: in demand and will sell at good prices when there is a surplus of the inferior high. If you have them a foot high in grades, that either are not wanted at the fall, they will not stand the winter. This is a practice of New Jersey We can hardly expect that under these growers, who cover them with the circumstances this order of things will leaves or salt hay at commencement of be changed or improved upon. It merit that is going to win, and if the dairyman expects to come out satisfiestorily at the end of the year it is of the greatest importance that he stars right. To try and do a little better than before should be the watchwest

agents sold one car load of cantaloupes for \$5 per crate. The varieties were This was said by some to be, without doubt, the finest car of melons that ever arrived in New York.

Agricultural Brevities.

Plant endive and spinach.

among good varieties for the season. At the Maryland station a difference has been found in favor of planting potatoes in narrow rows. This difference is commonly believed to be due to

the vines in the narrow rows, which causes a preservation of moisture. Continued seeding with clover, taking care that no plantain seeds are mixed with the clover seeds, is the

Don't neglect spraying. American Agriculturist reports late potatoes as making good growth. Cen-

tral Wisconsin has had excessive rains,

ered very much. Uncovering early in the spring and protecting them with a

bloom fully a month earlier.

Strawberry Mates, Etc.

of the day.-Live Stock.

Sweet peas are had in bloom from early planting in June and from later plantings in July and August. Sweet peas are planted in September or Octo ber and protected for the winter for early spring flowers. It is something new to have them growing all winter They are planted as late as possible. They should not be over six inches

winter, not very thick, as mice are very

fond of them and will eat them if cov-

cloth or something light from the freezes and thawings, and they have



some