

doubtful if any other method now practised will keep fruit as perfectly for use in spring. It must, however, be properly done or the results will not be satisfactory. Select a dry spot, place a layer of dry straw to a depth of not less than six inches under the fruit and eight to ten inches deep over it; this will be sufficient to absorb the moisture arising from the fruit and prevent them from having any odor or taste of the soil. Cover the straw with earth to the depth of two or three inches at first, leaving the straw exposed at the top for ventilation. This may be covered with boards to prevent rain penetrating. As cold weather comes on cover with more soil and coarse manure just deep enough to prevent freezing. In the milder sections, where the fruit often ripens up early, it is best to gather as soon as it is ripe and lay in heaps in the shade of the trees with a slight covering of straw, there to remain until there is danger of frost, when it can be placed in pits as directed above.

Pears should be picked as soon as the stem will part readily from the tree by taking hold of the fruit and giving a quick turn upward.

Early varieties can be at once placed in a warm room, where they soon become fit for use. If left on the tree to get fully ripe or mellow they are not nearly so fine in quality as when gathered and matured as above directed.

Winter varieties may be kept in a cool cellar and a quantity taken out at a time and placed in a warm room to ripen as required.

Plums cannot be profitably kept any considerable length of time after they are ripe enough to gather. This, however, is no great disadvantage, as they are used principally for canning and are in the best condition for that purpose when fresh from the tree, just before they begin to turn soft.

Perhaps no other fruit we grow, except apples, can be kept in as fresh state, fit for use, as the *Grape*. They may be kept until May with little trouble, and even much later by special care. Select such varieties as Vergennes, Salem, Agawan, Lindley, Isabella and Diana. They must become perfectly ripe before gathering from the vine and picked when quite dry and left to sweat for several days before packing. This may be done by placing on a table in bulk in any place where there is free access of air, after which they can be placed in baskets in layers, with paper between the layers, and placed in a cool room or cellar, where the temperature can be kept as uniform as possible. Packed thus they will usually keep until mid-winter in fine condition. For those intended to be kept still later, cotton batting can be substituted for paper. Cork dust, such as foreign grapes are packed in, will perhaps keep them still later. It should be thoroughly dry before being used. There is no difficulty in keeping Vergennes or Salem until July in good condition with this method of storing. A friend of mine keeps his grapes by placing them in layers in stone jars, with paper between the layers, and bury them six to eight inches deep in the earth, in some spot where the water will not lie. Cover the crocks loosely with a board or stone before putting on the soil. When the earth has frozen to the depth of four or five inches, some mulch, coarse manure or any material should be put on the ground to prevent the frost from penetrating any deeper, the main object being to keep the fruit at as even a temperature as possible. I have not tried this latter method, but have known it to be successful. With either method care must be taken not to injure or in any way break or bruise the skin of the grapes. Any thus injured must be taken out before packing.

Insecticides.

By Prof. A. J. Cook, Michigan Agricultural College.

(Continued from August issue.)

FOR GRAIN INSECTS.

But perhaps the most important use to which this liquid can be applied, is in the destruction of insects that attack grain. By its use, moths and beetles which attack the various grains in mills, granaries or in sacks, boxes and barrels, can be exterminated.

Several years ago I was employed by one of the leading trunk lines of railroads to investigate their wheat houses, which were infested by weevils and moths, in so much that the grain was seriously damaged.

In these investigations I learned that it was possible, easy and inexpensive to rid even large bins of grain of such pests, simply by the use of this liquid. If the building was close we had only to shut it up closely, throw in this bisulphide of carbon—otherwise we must throw the liquid onto the grain in the bin, and cover with oil cloth or any air-tight covering. As the vapor is so heavy it will sink to the bottom and seek out the insects, and mete out death to them.

I usually use an iron tube—gas pipe—to place the liquid down deep into the grain; but now think this was not necessary. A sharpened stick that just filled the gas pipe made it easy to run the pipe into the grain. Then by withdrawing the stick the liquid could be placed near the bottom of the grain, when the pipe was quickly withdrawn. By this method, of course the fumes would be less annoying while we adjusted the cover. Not long after these experiments, my friend Prof. W. W. Tracy, explained to me the great magnitude of the pea industry—raising peas—in northern New York. He said that this entire business was threatened with destruction by the terrible ravages of the pea weevil. Can you not, he asked, give us some cure for this great evil. I said yes, build practically air-tight houses, and use bisulphide of carbon. Prof. Tracy explained to the farmers just how to build the structures, and to use the liquid. And so the industry was saved; and to day these "Tracy houses" are in common use by the pea growers, who produce thousands of bushels of seed peas, and destroy the weevils in this way. D. M. Ferry & Co., of Detroit, have purchased from a single party in Jefferson county, New York, eight or ten thousand bushels of peas on a single contract. Each grower has one of these "bug houses." The houses are made air-tight; even the door is made very close fitting; and is made still closer, by pasting paper over the edges, upon closing it, after filling the house with sacks of peas. An air-tight flue at one end opens at the very top into the building and at the bottom out doors. A sort of chute with an adjustable air-tight valve is arranged to facilitate the turning in of the liquid. The liquid is turned in till the odor shows that the vapor is pouring out at the bottom of the flue. Then of course the air has all been forced out by the vapor, when the valve is closed. It is left closed for three days, then the doors are opened, so that the vapors may escape, when the weevils are all found to be dead. As already stated, the vapor of bisulphide of carbon is about two and one-half times heavier than air, so we easily see how the heavy vapor would settle and force the air up, and finally when the room was emptied of air and filled with these vapors the

vapor would be at the top of the room, and would pour down and out of the flue. Of course, from the law of diffusion of gases, the above cannot be strictly true, though practically it is so. Some of the growers, as Prof. Tracy informs me, do not build the houses, but rely upon a more simple method to use the carbon. Yet from the fact that accidents have occurred, and an occasional failure to kill the weevils, most of the growers now have their "bug houses." Prof. Tracy informs me that the firm of D. M. Ferry & Co. use the carbon to destroy the bean weevils in returned beans from the south, the cabbage seed weevil, and all other grain and seed insects. They simply use an air tight bin. Of course a water tight barrel or cask with a close oil cloth, buffalo robe, or other air-tight cover would suffice as well.

Some years since, one of the most extensive millers of Michigan, whose mills are situated in the very centre of one of the largest cities of the State, came to me with the very dolorous complaint that his mill—just purchased—was swarming with insects. There were caterpillars, and the larvæ of several species of beetles. He was discouraged, and said he wished he could burn the mill up, he would do it. I showed him how fatal bisulphide of carbon was to insects, by experiments in his presence; showed him how inflammable it was, by dropping a little in a jar, and in a moment dropping a lighted match into the same jar; explaining to him the possibility of destroying the insects and suggested that with due caution there would be no risk in the use of the liquid to free his mill of the pests. I need hardly say that he left me in a much more cheerful mood. This gentleman cleaned his mill as thoroughly as possible, closed it as completely as he could, and then used gallons of the bisulphide of carbon. He locked his mill and permitted no one to enter. He soon wrote me a most joyful letter. He said he had "utterly cleaned the bugs out." I went to see this gentleman a few days since. He says he regards this use of the carbon of great value to him. Each year since I first gave him the information, he has cleaned up and applied this insecticide, except last year, when the comparative absence of insects made it unnecessary. He uses about twelve pounds at once. He says it is wonderful to note how effective even a little of the liquid often is. He has purchased hundreds of gallons of the liquid, purchases it directly of the manufacturer at Cleveland, Ohio, in one hundred gallon cans at from ten to fifteen cents per lb. He always applies it on Sunday morning, when no one else is at the mill, watches it himself, and lets no one enter till he opens up and thoroughly ventilates the building. He thinks very highly of this liquid; not only because it is so excellent as an insecticide; but, as he says, you can throw it right onto flour, and soon it will vaporize, and the flour is in no wise injured. I asked this gentleman if he had read the account of the moth invasion of the Toronto mills. He said he had. I asked him what he thought of the report that a German had used this bisulphide of carbon with no success. He answered: They did not have me to use it. Use thoroughly enough, said he, and I do not believe any insect could stand it. I said what about the danger in its use? With caution, said he, there is no danger. "You showed me that the gun was loaded, and I keep the muzzle pointed from me."

[TO BE CONTINUED.]