

shrivelled. Lot II. was from the main planting, made in the latter part of April, and dug and stored in September. The tubers were quite firm, and had sprouted but moderately. Lot III. was seed from a second crop grown in 1889 in the following way. A few hills each of several sorts, from the plat which produced the seed of lot I., were dug July 11, and the potatoes planted the same day on ground that had been cleared of early peas. These gave a light yield of tubers of even size and of very fine quality. When taken from the cellar for planting they were as firm and free from sprouts as when stored.

Three pounds of each of the above lots were cut to three-eye pieces, and planted March 18. With one exception, the sorts in lot III. were from five to eight days later than the others in coming up, while between lots I. and II. no difference could be noted.

The vines of lot III., when they came, were much stronger than the others, and in a few weeks overtook and outgrew the other lots, making a much more vigorous and heavy stand.

The date of blooming, though not varying uniformly on the whole, favors the vigorous plants of lot III. for earliness, and shows that the comparatively weak and slender plants of lot I. bloomed later, or in three cases failed to perfect any bloom.

The date at which they afforded potatoes of table quality did not vary appreciably in favor of either, but the product, both in quantity and quality, was largely in favor of lot III.

While the product of lot II. was not, in all cases, much ahead of lot I. in weight, the percentage of marketable tubers was greater, and these were of greater average size.

Summarizing the results of this trial, it seems, first, that nothing is gained in earliness by the use of second-crop seed; second, that there is a positive gain in amount of product, as well as size of tubers, over that of first-crop seed grown in the same locality; third, that firm, well-kept, unsprouted seed is better than that which is sprouted and shrivelled, giving a heavier product and of better size and quality. These inferences may not be conclusive, but seem to be fairly deducible from the above results.

Still further to test the practicability of growing the second crop of potatoes in one season, five pounds of seed of each variety in lot III., as above mentioned, were dug July 23, and planted the same day, cut in halves. These came up rather unevenly, the same fault having been noticed in the previous trial. The product was of unusually fine quality, and the yield a very good one, when it is considered that potatoes of ordinary planting were almost a failure in that section of the country.

ENTOMOLOGICAL OBSERVATIONS AND EXPERIMENTS.

THE reports of the six permanent field agents of the Division of Entomology of the Department of Agriculture are included in a bulletin just issued from the government printing office at Washington. These reports are printed in full, though they are little more than summaries of the work in general performed by each agent. Special reports upon specific subjects have from time to time been sent in by special direction, and those have been published in *Insect Life*.

Mr. Lawrence Bruner, who last year reported upon the insects injurious to young trees on tree claims, has the present season devoted much of his attention to insects affecting, or liable to affect, the sugar-beet, a crop of growing importance in Nebraska, the State in which he is located. Although but one season's collecting has been done, some sixty-four species have been observed to prey upon this crop. As is shown by the report, nearly all of these can be readily kept in subjection by the use of the kerosene emulsion or the arsenites.

Mr. D. W. Coquillet's report, from California, is mainly devoted to methods and apparatus for the destruction of scale-insects by means of fumigation. The experiments were aimed at the red scale, which is one of the most difficult to treat with washes. He describes the simplified tents and the rigging which enables them to be used rapidly, and shows the advantage of excluding the actinic rays of the light. Judging from recent California newspapers, the use of this method of fighting scale-insects is rapidly increasing, and the comparatively expensive apparatus is already owned by a large number of fruit-growers. This improved method

is the legitimate outgrowth of experiments which were instituted by the department at Los Angeles in 1887, and possesses the advantage over spraying that it can hardly be done in a slovenly manner. If used at all, its effects are nearly complete.

Mr. Albert Koebele, while reporting upon a number of interesting fruit pests, notably the tent caterpillars of the Pacific slope, and a noctuid larva which destroys the buds of certain fruit trees, devotes most of his report to the description of certain tests, which Professor Riley, the government entomologist, directed him to make with different resin compounds against the grape phylloxera in the Sonoma Valley during September and October of the past year. The results have been fully as satisfactory as were anticipated, and the economy of the process is very striking, labor being practically the only expense.

Miss Mary E. Murtfeldt reports upon the insects of the season in eastern Missouri, and also gives the results of experiments which she has made with certain insecticides submitted to her from the office of Professor Riley for trial. She also presents descriptions of four *Microlepidoptera*, which are new in the rôle of feeders upon the apple.

Professor Herbert Osborn reports upon the insects injurious to forage-crops, meadows, and pastures in Iowa. His report last year was mainly taken up with the consideration of the leaf-hoppers, to which he gives some further consideration this year, adding some notes on locusts and crickets. He presents also a series of miscellaneous observations.

Mr. F. M. Webster of Indiana devotes his report mainly to the Hessian fly, discussing the number and development of broods, the effect of the larvæ upon plants, the effect of the weather on the development of the fall brood, and preventive measures. He also gives some notes upon three of the species of plant-lice found commonly upon wheat.

NOTES AND NEWS.

THE Rev. J. Hoskyns-Abrahall writes to *Nature* that on June 10, about 10.30 P.M., near Woodstock (England), he saw what he describes as "a beautiful phenomenon." "Suddenly," he says, "at the zenith, east of the Great Bear, shone forth a yellow globe, like Venus at her brightest. Dropping somewhat slowly, it fell obliquely southward. As it passed in its brilliant career, it lighted up its dusky path with a glorious lustre. When it had descended about half-way down toward the horizon, it burst into a sparkling host of glowing fragments, each dazzlingly shot over with all the hues of the rainbow."

— According to *Industries*, two novel modifications of sulphur have been recently discovered by Engel. The first, like that proved to exist in Wackenröder's solution, is soluble in water and very unstable. The other is crystalline, soluble in carbon disulphide and chloroform, and polymerizes slowly in the cold, and quickly at a temperature of 100° C., but, unlike prismatic sulphur, which changes on keeping into the octahedral variety, it becomes converted into the white insoluble form which commonly constitutes so large a percentage of the material known as "flowers of sulphur."

— In a new process for the manufacture of phosphorus by electricity used by the Phosphorus Company, at Wednesfield, near Wolverhampton, England, says the London *Engineer*, the raw material and coke are all fed into a specially designed furnace, reduced to vapor by electric heat, and the vapor condensed into marketable phosphorus, the elaborate chemical material hitherto needed in dealing with the raw materials before putting them into the furnace thus being dispensed with. The estimated consumption of phosphorus throughout the world is only two thousand tons per year, used chiefly for match-making. Extensions are contemplated at Wednesfield, which will ultimately, it is anticipated, lead to the company being able to make half this quantity, at that place.

— W. J. Lincoln Adams, editor of the amateur photography department of *Outing*, says in the July number: "The preparations for the twelfth annual convention of the Photographers' Association of America, which will be held this year in Buffalo from July 14 to 17, are actively progressing, and the indications