



Connecticut Agricultural Experiment Station

NEW HAVEN, CONN.

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Bulletin of Immediate Information, No. 46

July 26, 1924.

PREMATURING OF VEGETABLES, ROTS OF LETTUCE AND SIMILAR TROUBLES.

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The spring and summer of 1924 have so far had somewhat unusual weather conditions. The spring was cold and wet, so that many ornamental plants, fruits and vegetables were very backward in their development. The blossoming period of apples and peaches was quite extended with a good bloom but only a fair set. Peonies were very late in blooming and of short duration. Some growers lost much of their vegetable seed because the conditions favored rot or dampening off. June and July came on warm and dry but with fairly cool nights. As a result of these conditions certain peculiar troubles, especially with vegetables, have developed. One of these is the prematuring, or going to seed, of plants that would not normally do so. The following are the crops of which we have heard complaint.

PREMATURING.

Cabbage. One grower had considerable trouble with cabbage that instead of heading out normally formed small heads and then started to blossom. He had to pull up those heads and feed them to the hogs. While the season, wet early and then dry, was favorable to this development, the fact that the plants were somewhat overgrown and had been held back before set out helped to favor this abnormal development.

Beets. It is expected that seedling beets if re-set may in some degree go to seed instead of continuing to form normal bottoms. The season favored prematuring to an unusual degree since not only re-set beets but also the undisturbed seedlings in some cases showed such a tendency.

Onions. There has been considerable complaint that onions grown from sets formed seed stalks to an unusual degree. Ebenezer or Japanese (considered by some as identical and by others as distinct strains), seem to be the most generally raised by vegetable growers. There apparently has been considerable difference in the production of seed stalks by these onions this year. As a result some growers regard the Ebenezer variety as no longer unmixed, others that it has degenerated and that the Japanese strain is superior, others that the source of the seed is the chief factor, while others that the time of topping and the character of the season have had the most influence. Such onions, if seed stalks are formed commonly, are very inferior since the stalk continues into the bulb as a hard center. Topping when very young is said ordinarily to overcome this trouble. Some growers had onions from two different sources planted on the same land at the same time that showed a marked difference in the formation of seed stalks.

Lettuce. A good summer lettuce seems to be needed in this state, as most of the varieties grown do not do so well in the warm summer weather. One of the difficulties complained of this year was the heads going to seed before they could be marketed. Big Boston gave more trouble in this respect than Salamander.

ROTS AND OTHER LETTUCE TROUBLES.

Basal Rot. There was general complaint of rots of head lettuce grown out of doors this year. The wet spring weather seemed to favor the maximum development of certain soil fungi and bacteria, and while the dry weather of June and July checked the rots, the cool nights still allowed sufficient moisture to collect in the soil under the plants and on the edge of the leaves to continue them less seriously up to the middle of July.

A study of infected plants from a number of growers showed two types of rots. The basal rot starts from certain soil fungi, *Rhizoctonia Solani* or rarely *Pythium deBaryanum*, that gain entrance through the leaves in contact with the wet earth. Ordinarily these do little harm as the infected basal leaves can be stripped off before any general invasion of the head occurs. But the present early wet season favored further infection of the leaves within the head, forming a general red heart rot. The *Rhizoctonia* mycelium in certain cases could be seen in dense masses entirely destroying the softer tissues. Neither of these fungi form aerial spores so that infection is through contact with the soil only. Both Salamander and Big Boston suffered from this type of rot.

Leaf Edge Rot. The second type of rot seemed to start from the edge of the leaves, probably favored by the moisture that accumulated there during rain or dewy nights, and worked down-

ward more or less irregularly into the head. Such heads often were entirely sound on the outside but when marketed complaint was usually made of interior rot. When broken open irregular larger or smaller areas of reddish brown rotted tissue would be seen. Under favorable moisture conditions these became enlarged into a more general head rot. Even when not conspicuous these rotten areas within the head rendered it of little commercial value, especially in an overstocked market. This type of rot was the more unusual and serious of the two. One grower lost 70% of 100,000 heads of Big Boston from this trouble. In this case our investigations seem to indicate that bacteria were the primary cause of the trouble as they were present in great quantities in the infected tissues where no fungi were seen. Eventually in both this and the basal rot other fungi, bacteria and nematodes occurred in the badly rotted tissues. The liberal use of manure on the land or green cover crops plowed under and not fully rotted would favor this type of bacterial rot. The spread from plant to plant may have been due to insect carriers.

Leaf Burn. Certain heads were seen that showed the exposed edges of the leaves seared inward for a short distance as if sun scorched. Within the tissue sometimes occurred a miscellaneous growth of saprophytic fungi. Whether or not this is a distinct type of injury or merely the arrested condition of the Leaf Edge Rot was not determined.

White Heart. This seems to be entirely a physiological trouble due to the type of lettuce or to the seasonal conditions. Big Boston is subject to it, and develops it most in the warmer season of the year. The heads are formed but instead of being compact, are rolled loosely with the central leaves irregular, whiter and harder. The outer leaves often droop and the lettuce besides being inferior in quality does not stand up well. There was some complaint of this trouble also.