

STREAK DISEASE IN SWEET PEAS.

(From the "Gardeners' Magazine.")

Much has been written about the cause of "streak" in sweet peas, and if printers' ink could have cured the disease it would have long ago ceased to trouble us.

A high authority says: "The name by which the disease is known to-day—*Thielavia basicola*—was given to it by Zopf in 1876, since when, it has engaged the attention of various scientists, all of whom by various and different methods have arrived at the conclusion that errors of watering and manuring were largely responsible for the existence of the disease wherever it occurred.

"Probably no one cause contributing to the weakening of the root, and thus laying it open to attack by the fungus, will be found that will fit all cases of disease, but there seems no doubt that if care be taken to avoid every possible check to root development and activity, the 'streak disease' will cease to be so troublesome."

The same authority says, "Overwatering must be avoided at all costs." Whilst freely admitting that "overwatering" would destroy plants, let us rather seek the primary cause of "streak disease" in some other direction, for sweet peas growing under glass are ordinarily watered daily if necessary, and not infrequently twice a day, and yet there is no appearance of "streak."

Instead of concerning ourselves with the name of the disease, or even as to its nature, we may consider the physiology of the plant and its functions.

The sweet pea belongs to the leguminose family of plants, all of which are naturally supported by nodules on the root containing nitrogen-gathering bacteria, which, in their turn, assimilate the free nitrogen of the atmosphere for the use of the plant. I said naturally, for this function seems to be imperative, as when we unnaturally feed any of the leguminous plants mainly on nitrates or nitrogen-containing material, these plants freely feed on the nitrates of the soil, and it appears that nitrogen-gathering bacteria in the root nodules die of inanition; in fact, an unnatural balance is set up in the economy of the plant, which assumes a parlous condition, susceptible of any and all diseases to which the plant is liable, and death ensues.

"Streak," or any of the fungoid diseases, may be latent, developing when suitable conditions are afforded.

I do not feel concerned to prove this, for it is sufficient to know that plants of sweet peas remain healthy, and free from "streak" and other diseases, when nitrates and nitrogen-containing mate-



ROSE, "SOUVENIR DE MADAME VIENNOT."

The fine specimen of the splendid climber shown in the photo, is growing in the garden at Mr C. Spencer's residence, Pongsonby, Auckland. At the time the photo. was taken the bush carried 120 blooms, 70 of which can be counted in the illustration.

rials are not applied to the soil in which the plants are to be grown.

It is an established fact that the legumes of our pastures are all destroyed by the too free application of nitrogenous manures, and it is not surprising that the sweet pea should also be susceptible, and succumb to similar treatment.

E. W. Duckwell, in "Bacteriological Technique," says: "The bacteria which prove so valuable in fixing the atmospheric nitrogen for the benefit of peas, have a peculiar life history. They are widely distributed in the air, water, and soil, but are frequently absent in some localities, or are so few in numbers as to be of little value to peas grown in such places. When through inoculation, bacteria gain entrance, rapid multiplication takes place, so that in a short time

the sap is teeming with countless myriads of these tiny organisms, which fill up all the channels, multiplying, until this cycle of their life history is accomplished."

In a general way, for the healthy growth of sweet peas, most soils require an annual application of phosphates and potash, chalk or lime (ad lib.), with small quantities of magnesia salts, etc., and all these may be applied without being associated with nitrogen-containing material, such as animal manure and the like.

A question may naturally arise. If the use of dung and other kinds of organic manure are to be avoided in the growth of sweet peas, how is the necessary supply of humus in the soil to be maintained? The answer is by manuring the preceding crop with organic manures containing nitrogen, if this be necessary.

If it should be desirable to grow sweet peas on the same land year after year, the supply of humus may be maintained by the application of well-rotted manure, which has been prepared by remaining in a heap for about twelve months, for it has been ascertained, that stable manure loses, approximately, 25 per cent. of its nitrogen every three months, and the soil bacteria during the twelve months would have worked up the nitrogen-containing material successively into nitrates, and free nitrogen, and the latter would by this time have been liberated, and lost in the atmosphere, the residue being mainly organic manure minus nitrogen.

A question might arise, if nitrogenous manures are not to be used, how are plants to be fed and to be made to produce exhibition blooms? The answer must be: Wait until the plants become well matured before applying any nitrogen, then, possibly, an addition might do but little harm, and might be the means of winning the cup, even although it might ultimately injure the plants.

It does not follow that because nitrogen is absolutely essential to the successful growth of most crops it should be so for all plants.

Nitrogen acts as a poison to sweet peas and all legumes, and the sooner this is recognised, and acted upon, the better.

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THE DAFFODIL AS A SHOW FLOWER.

A writer in the "Journal of Horticulture" says:—There is no other flower with the possible exception of the rose, that looks at home in so many different surroundings as does the daffodil. A little while ago I saw it, in the form of the Lent lily, growing in thousands almost wild over grassy meadows. Its pale golden blooms, gleaming in the light of the western sun, looked so lovely with the green setting given them by the grass that I could not help thinking this must surely be the right and best way of growing the daffodil. But when I came home and went into the garden, I saw the beds and borders, banks and rockery filled with some hundreds of different forms of this flower; the effect of the big trumpets on their stalwart stems, the graceful Leidsi and the starchy poetens was altogether wonderful. The blending of countless shades of white and cream, yellow and orange, seemed to prove that, after all, the daffodil was equally as happy and effective in the cultivated garden.

The last daffodil picture of which I have to write is suggested by the title of this paper, and is a picture in which



SAXIFRAGE GRANULATA, "COMET," EXHIBITED BY MRS. E. LLOYD EDWARDS, AND GIVEN AN AWARD OF MERIT BY THE ROYAL HORTICULTURAL SOCIETY.