

lamps, illuminating gas with welsbach mantle, acetylene and finally the flat-wick kerosene flame. None of these other sources gave exactly the same color values as daylight. However, the approximation to daylight was surprisingly good, and the worst one, *i. e.*, the kerosene flame, gave better color values than the best artificial light without the color screen. The original intensity of the carbon-filament lamp and the kerosene flame is not great enough to give the best results with the daylight glass. This is because much of the artificial light must be absorbed to render it like daylight.

To the writer it seems that this glass must be a great boon to all those who must use the microscope with artificial light. As the light is soft like that from a white cloud, the comfort to the eye is most gratifying; and of almost equal importance, it gives certainty in distinguishing the most delicate colors and the various combinations of colors. It seems, furthermore, to promise great help in the textile and dye industries, in chemistry and in medicine, as it offers a standard daylight without the changes of real daylight depending on whether the sun is shining or whether the light is from the blue sky or from a cloudy sky. And finally it is believed from the experiences of the writer, that it will furnish great relief to those with sensitive eyes who must work by lamp-light, as it renders the light soft and agreeable like the most favorable daylight.

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A NEW ALFALFA LEAF-SPOT IN AMERICA

WHILE passing an alfalfa field in the vicinity of Manhattan, Kans., in October, 1914, the writer's attention was attracted by the irregular stand, which was noticeable from the road. Since light frosts were rather frequent at the time of year, the condition of the alfalfa was at first thought to be due to these, but closer examination indicated that these could not be the cause. Careful investigation showed that a leaf-spot was prevalent on many

of the plants, and that it was strikingly different from anything with which the writer was familiar.

The plants affected were not producing a normal amount of foliage, the stems being sparsely set with spotted leaves, which were affected with a singular leaf-spot. The diseased plants thus presented an unthrifty appearance, and were also somewhat smaller than normal plants.

Since this was discovered on the last crop of the season, there was a question in the writer's mind whether it would be confined mainly to the latter part of the alfalfa season, or would make its appearance on the earlier crops. In the present season a close watch was kept on the first crop. The disease was again located in the aforementioned field on April 17, 1915, and further investigations have shown it in a number of fields belonging to the agricultural college. Furthermore, specimens have been collected in different localities within this state and other states. It has likewise appeared to a greater or less extent in the second and third crops in Kansas.

The material collected last fall was studied in the laboratory this winter, and cultural and inoculation experiments are now under way. There is no question as to its pathogenicity. The fungus is an ascomycete, the perfect stage (perithecia) being found in the mature spots. It belongs to the genus *Pleosphaerulina*. The writer has been unable to locate any literature pertaining to its occurrence in America. The species has not been definitely determined. An alfalfa leaf-spot due to *Pleosphaerulina Briosiana* Pollacci has been reported by Pollacci,¹ Bubak² and Puttmans,³ in Italy, Austria and Brazil, respectively. There is some doubt, however, whether the species with which the writer is working is *Briosiana* Pollacci,

¹ "Spora una nuova malattia dell'erba medica," *Atti del Instituto Botanico, dell' Università di Pavia*, Nuova Serie, Vol. II., Serie 1901.

² "Eine neue Krankheit der Luzerne in Osterreich," *Wiener Landwirtschaftliche Zeitung*, Nov. 20, 1909, Nr. 93, s. 909.

³ "Diseases of Cultivated Plants," *Revista Agricola Sao Paulo*, Nos. 114-125, pp. 379-381, 1905.

since Bubak,² in his description of this alfalfa leaf-spot, states that a perithecium does not contain more than three or four asci; while, in the material at hand, the number varies from 8 to 14. Furthermore, the ascospore and ascus measurements do not agree entirely with those given by Pollacci,¹ or Bubak. Pollacci first reported and named the fungus in Italy. He does not give the number of asci in a perithecium, and his ascospore and ascus measurements do not agree with those by Bubak, although the latter regards the species as the same. Puttmans³ describes a variety, naming it *Pleosphaerulina Briosiana* Pollacci var. *Brasiliensis* Puttmans nov. f. He regards it as different from *Pleosphaerulina Briosiana* Pollacci, in that the ascus and ascospore measurements are larger. Among the seven species under the genus *Pleosphaerulina*, described by Saccardo,⁴ including *Briosiana*, nothing further is elucidated.

A description of this alfalfa leaf-spot as it occurs in Kansas is as follows: The spots are scattered irregularly over the entire leaf surface, frequently causing spots along the margins. These spots are generally circular or elliptical, from 1 to 5 mm. in diameter. During the earliest perceptible stages, the spots appear as very small, dark-reddish-brown spots. These soon increase in size, a dark-brown margin bounding the ashen-gray center of the spot. The centers of these spots may vary from a light tan color to ashen-gray. This tissue does not fall out, but remains intact. The spots are confined almost exclusively to the leaves, but the fungus does attack the petioles. The perithecia are visible to the unaided eye if they are mature, appearing as very small black dots. They occur rather sparingly, irregularly and promiscuously scattered within the centers of the spots. They are more or less membranous, partially immersed, erumpent, globular to oblong, slightly pyriform, glabrous, dark brown to black, 100–120 μ in diameter. The asci are ovoid in shape, varying from 8 to 12 in number, and measuring 56–75 μ long, and 38–42 μ wide. There are no paraphyses,

which fact distinguishes this fungus from the genus *Catharinia*. The asci are supplied with a pedicel at the base, with which they are attached to the wall of the perithecium. Each ascus is provided with a peculiar tongue-like projection at the apex, this being a striking characteristic. This does not appear to be described or mentioned, so far as the writer has been able to find, in Pollacci's description of this fungus. The ascospores measure 12–14 μ wide, and 30–32 μ long. They are generally arranged so that 5 ascospores are located at the base and larger end of the ascus, and 3 in the upper or narrower part. The spores are multicellular, oblong, fusiform, conspicuously granular, and greenish-hyaline, and having from 3 to 4 septa, and from 1 to 3 longitudinal divisions, making from 5 to 7 cells, rarely 8.

This leaf-spot may prove to be of considerable economic importance, since like the *Pseudopeziza* leaf-spot, it causes destruction of the foliage.

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DIFFERENTIATION OF WANDERING MESENCHYMAL CELLS IN THE LIVING YOLK-SAC

THE yolk-sac of the teleost egg is a particularly favorable object for observing the movements and migrations of cells in the developing embryo. Such a yolk-sac has only one really definite continuous membranous cell layer, the ectoderm; a true endodermal layer is absent, though a superficial syncytium, the periblast, fuses with the actual yolk surface. The mesodermal layer is represented by numerous separate wandering mesenchymal cells. These freely wandering mesenchymal cells may be clearly observed through the perfectly transparent ectoderm as they move over the surface of the periblast.

The writer has attempted a detailed study of the movements of the mesenchyme cells and their manner of development and differentiation on the yolk-sac. Observations have been made on the normal embryos from the earliest stages at which the mesenchyme wanders out upon the yolk up to the late embryo in which a com-

⁴ Sylloge Fungorum., Vol. XI., XIV., XVI. and XVII.