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# PLANTS RESPONSIBLE FOR HAY FEVER

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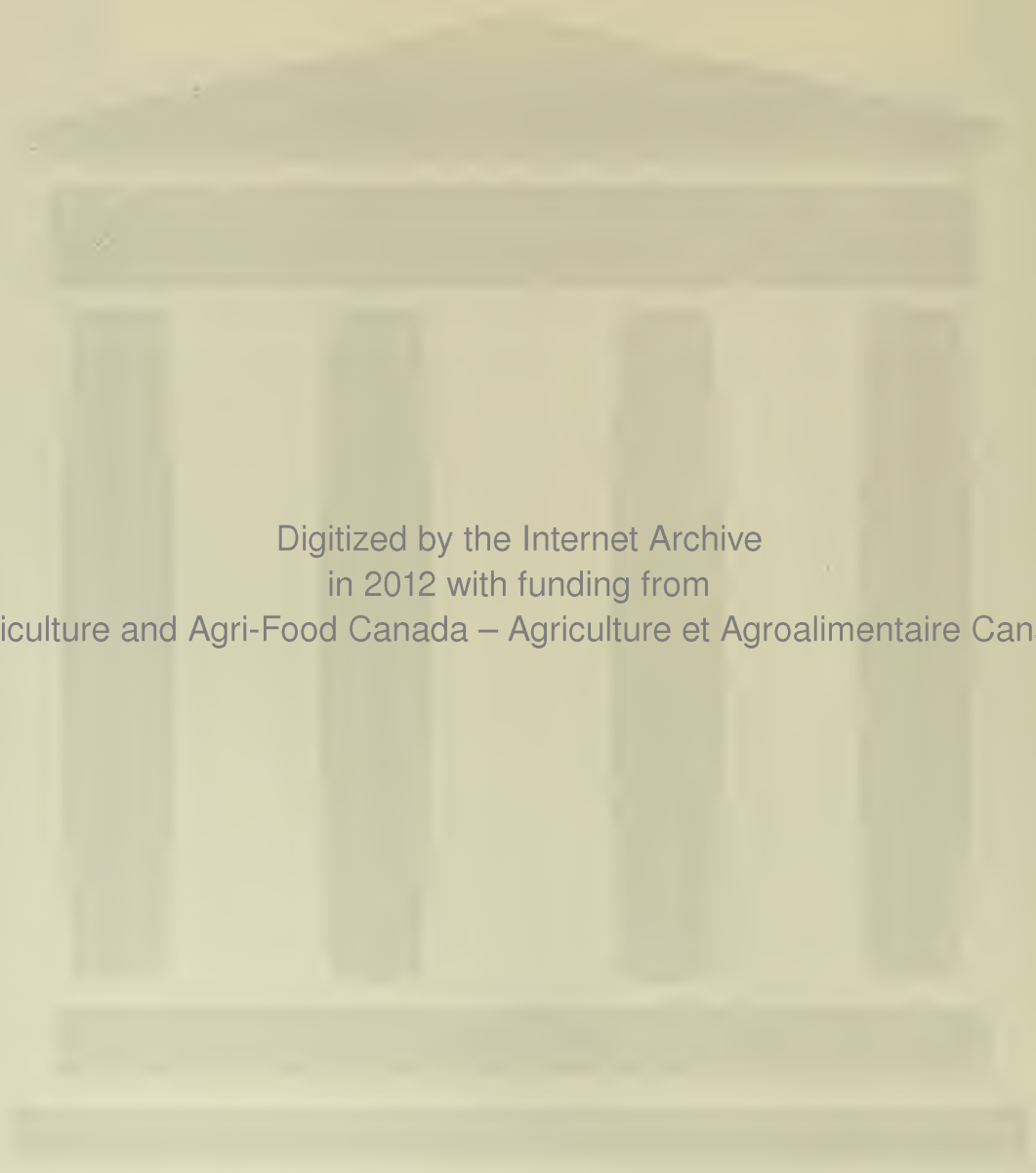
DIVISION OF BOTANY  
EXPERIMENTAL FARMS BRANCH



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## PLANTS RESPONSIBLE FOR HAY FEVER

From the number of inquiries constantly being received it is clear that the disorders commonly known as hay fever are matters of concern to a great many people. That so many of these appeals for information should be directed to a botanical service is evidence, too, of a widespread acceptance of the vegetal, or more strictly, organic source of the trouble. While there is still much to be learned as to exceptional forms of the ailment, this present assignment of cause seems substantially correct. There is still need, however, for a clarification of ideas commonly held as to the plants responsible, the means by which they give offence, and the protection at the disposal of the unfortunate victim.

Of numerous organic substances, including dusts, animal scurfs, food-stuffs, as well as plants, now proved to be excitants of hay fever, and related complaints, certain plants, through their pollens chiefly, are undoubtedly the foremost offenders. The term hay fever is itself a recognition of this, and in the Old World more often than in the New, accurately designates the prevailing incitement of the malady. Grasses there, more truly than here, are predominant in the land cover; while certain weeds, there of slight importance, play here a major rôle.

Agreeing then, that most hay fever is induced by the inhalation of plant pollens, the proteins of which set up the well-known disturbances in the human system, it must still be noted that not all persons are so affected, and of those reacting not all, by any means, are susceptible to the same provocative. Thus, among other things, it is found that one will be regularly prostrated early in the year, another in mid-season, and still others in late summer or autumn, the incidence of attack being that of the period of bloom of the plant or plants to which each is sensitive. On this continent by far the greater number of sufferers are in the late-season category. Largely because at this time goldenrods are in conspicuous profusion, these familiar plants have had to bear the brunt of popular suspicion—unwarrantably, as we shall see. Other weeds, less in the public eye, are equally abundant and better fitted for mischief.

It has been well pointed out that to be of consequence as an agency in hay fever, a plant must be of wide and abundant occurrence, it must produce pollen in quantity that is light and wind-borne, and finally, this pollen must contain an excitant of hay fever, which is not uniformly the case. One species may combine in itself the foregoing characteristics in a high degree, while another exhibits few, or none of these potentialities for harm.

In exoneration of the goldenrods, then, it may be said that they are not heavy producers of pollen, and what they have is ill-fitted for wind dispersal. On the contrary, their bright yellows and their yield of nectar are lures for insect visitors, to the end that the required cross pollination may be accomplished with an economy of pollen. The sticky and heavy pollen grains adhere to the bodies of these messengers, to be brushed off in the next flower in its turn. From all this it must be apparent that relatively little goldenrod pollen is in the air where it would be inhaled. Any individual susceptible to it would need only to refrain from smelling or from coming otherwise too closely in contact with the bloom.

As further examples of plants negligible from the hay fever standpoint, pine and spruce may be cited. In this instance a profusion of pollen is produced to the extent that shores may be seen lined with the washed-up yellow scum of deposits on the water—pollen, however, which is quite innocuous.

By way of general classification, spring hay fever can usually be attributed to the light pollen of trees (maple, elm, poplar, butternut, oak, ash, birch, etc.), most of which bloom at that season; later the dust-laden air is the active



medium in the pollination of the grasses such as rye, timothy, red top, orchard grass, blue grass, couch grass, etc.; and as the season advances weeds of all descriptions arrive at flowering. Those of most importance as causing autumn hay fever belong to the rag-weed and thistle families, although plants of the



Ragweed, outstanding excitant of hay fever

pigweed, goosefoot, buckwheat, plantain, and a few other families are of some account. It is claimed that about 70 per cent of all hay fever victims in America owe their trouble to common ragweed (*Ambrosia artemisiaefolia* L.) and related

species. One authority states, "Of the hundreds of thousands of autumn hay fever cases in the United States each year, 90 per cent east of the Mississippi river are caused by ragweed." In the drier West various wormwoods (*Artemisia* spp.), and western members of the ragweed, goosefoot, and other families are the chief menaces.

This responsibility of ragweed for so large a proportion of hay fever attacks is due, apart from undoubted virulence, to the wealth of pollen produced, its buoyancy in the air, and the density of infestation which the weed attains in much of our territory. Because of its modest appearance few people realize the degree of its prevalence.

Within Canadian bounds the common ragweed is probably at its worst in the southwestern peninsula of Ontario, and almost equally so in the rest of older settled Ontario and southern Quebec. Elsewhere in the East it is in much less amount in keeping with the less intensive agriculture practised. Through all the sparsely populated North, from Gaspé to Rainy River, it is usually negligible, and even in the open prairie what ragweed there is usually is the related perennial ragweed of the West, or great ragweed, both of which occur rather sparingly eastward. A single plant of the common ragweed, found in 1934 on a railway siding at McLennan, Alta., the gateway to the Peace River district, was apparently an outpost of coming invasion in that direction. Wherever abundant, this plant, by reason of the density of its growth, its coarseness when not growing so densely, and its rejection by animals because of rankness of flavour, must be rated as one of the most objectionable of the annual weeds.

The villain of so much annually recurrent distress should be more generally recognized than would seem to be the case. The farmer who must combat its inroads upon his crops doubtless knows it best, for after a crop of hay or grain has been removed it pushes up rapidly and spreads its mantle of dissected and well-named foliage over the late fields. Unless mowed or turned under by a timely after-harvest ploughing it keeps up a succession of bloom to the end of the season.

The flowers are of two kinds, produced on separate portions of the plant. Those which bear the pollen are disposed along spikes terminating the plant and its branches, and are evident enough. Others, fewer in number, are located in the axils of leaves lower down and, like the rather large single-seeded nutlets which succeed them, escape most people's notice. Plenty of seed is produced amply to ensure reproduction and further dispersal, for the species, being of annual duration only, has no other means of survival. By conscientiously preventing the maturing of seed, therefore, until that already lying in the soil is grown out in the course of a few years, it is possible to restrict the weed materially.

Measures that would result in complete eradication would be the ideal solution for the troubles of most autumn hay fever sufferers, but that degree of success, unfortunately, is not in sight. Even the best of attention given to field suppression, desirable as it is agriculturally, and to mowing of roadsides, commendable also from the aesthetic viewpoint, still leaves untouched far too much scattered infestation from which fresh seed pollution may take place, and from which also clouds of pollen may drift to nullify most of the benefit from any partial clean-up. In regions of sparse occurrence it is, of course, good practise to pull every plant discovered with a view to retarding spread, and thus to keep the danger locally at a minimum.

As things are throughout the more densely populated areas of North America, the finding of relief resolves itself largely into one or the other of two alternatives: either getting beyond the bounds of the plant to which the individual is sensitive; or having determined what pollen is responsible, submitting to treatment with the appropriate pollen extracts for the protection of desensitization. Since this is a matter for consultation with a physician it need not be gone into



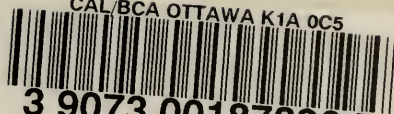
further here. Hundreds do find this a solution for the problem of what to do with themselves during a trying season. Others preferring not to subject themselves to the inconvenient or sometimes unpleasant effects of the treatment, and able to afford and arrange an extended vacation, are concerned to know where they may go to find safe asylum.

Assuming first that the patient is one of the vast majority susceptible to common ragweed, the advice would be to get away from almost any well settled part of Eastern America, either into some remote mountain retreat, or northward. Those concerned often fail to realize how closely the sparsely populated hinterland of Canada—the Laurentian Shield—lies to our back door at places. In these days of ready access, too, with provision everywhere for the comfort of the tourist and summer resident, a wilderness sojourn is by no means a hardship. Even the most fastidious are well served at resorts along the north shore of the lower St. Lawrence or on the Gaspé coast, where the virtual absence of ragweed has been demonstrated by actual surveys. Sufferers from the Midwest are equally well served in the nearby Lake Superior or Rainy River resorts.

It will sometimes happen that change of residence from West to East or vice versa will afford relief owing to sensitiveness to some element of the flora left behind, as for instance, the western wormwoods. In other cases, where ragweed is not the plant responsible, it may require some experimentation before the true culprit is located, and either the appropriate treatment or change of location can be fixed on. Also in the event of grass pollens being responsible, it may prove difficult, short of a sea voyage, to move out of their rather ubiquitous range. Finally it is not to be forgotten, when obliged to remain at home with one's tormentor, that hay fever attacks are often aggravated by drafts, such as those provided by modern electric fans and fast-moving motor cars.

Extensive treatises have been written, and experiments are still in progress seeking to bring order out of past chaos in the understanding and treatment of hay fever. All that it is hoped to do here is to outline broadly the nature of the field so that the anxious inquirer may proceed rationally in his search for relief.

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