

'Glen Moy' Red Raspberry

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Since its release from the Scottish Crop Research Institute in 1982, 'Glen Moy' has rapidly become the leading cultivar for early fruiting in Europe and the cultivar most frequently chosen for all new plantings in Britain. British raspberry growers, particularly those in Scotland, have always preferred cultivars that crop early, partly because the raspberry season is later than in many other production areas. Hence, 30 years ago the most widely grown cultivars in Britain were 'Malling Promise' and 'Malling Jewel'; this was followed by 'Glen Clova' and it is now 'Glen Moy'; these were all the earliest cultivars available. On average, 'Glen Moy' was two days earlier than 'Glen Clova' in a Scottish trial (1). Recently growers in Holland and France have realised the considerable market requirement for very early raspberries, and have devised means for producing early fruit under protection some two months before field production starts: 'Glen Moy' suits these methods well. Indeed, it could be said to be a cultivar which became available in the right place at the right time.

One reason why 'Glen Moy' has replaced 'Glen Clova' so rapidly is the ban on the use of dineseb-in-oil to control excessive vegetative vigour. The canes of 'Glen Clova' are difficult to manage unless they are chemically burned down in spring but this is not the case for 'Glen Moy'. However, the more important reason for preferring 'Glen Moy' is its much superior fruit quality. It has an excellent flavor, pleasantly sharp with aromatic overtones; its fruits are uniformly large, typically averaging 3.5 to 4.0gm and appreciably larger than those of 'Glen

Clova'. This gives the cultivar a potential for much higher yields. It is probably the main reason why 'Glen Moy' has usually been top yielder in trials. The fruits are also firm, have a good shelf-life and an excellent medium red color, though without the gloss preferred in parts of North America.

'Glen Moy' and 'Glen Prosen' were released at the same time and were the first red raspberries to be totally spine-free, being homozygous for gene *s*, which they have inherited from 'Burnetholm', a distant ancestor. They are thus both grower-friendly and picker-friendly, and are particularly popular among pick-your-own growers and amateurs.

The pedigree of 'Glen Moy' is complex. It is a fourth backcross hybrid of the black raspberry, *R. occidentalis*, which probably contributed to the firmness of its fruit texture; and one of its grandparents is 'Glen Clova', which probably contributed to its earliness, though several of its other ancestors were also early.

Methods for producing very early strawberries under protection have been perfected for sometime in continental Europe and it is only in recent years that attempts are being made to achieve the same success with raspberries. The methods require an early cultivar to give maximum response to the early rise in spring temperature and 'Glen Moy' has proved ideal. A small proportion of 'Glen Clova' is sometimes grown with it because of this cultivar's reputation for copious pollen production. A common method is to plant raspberry canes in mobile containers (buckets, baskets or plastic grow-bags) in October or November,

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hold them in a cold store until January or February and then move them to plastic tunnels or glasshouses in January or February for cropping in late April and May. The containers are then moved to provide space for another crop. Sometimes the canes are densely planted in a plastic tunnel and removed after cropping. Yields of 1.0 to 1.5Kg/sq. metre are claimed with an average fruit weight of 8gm.

'Glen Moy' rarely suffers from virus disease. It has major-gene resistance to two of the four strains of the large European aphid and virus vector (*Ampiphora rubi*), but it commonly carries small populations of this aphid. Like 'Glen Clova,' it carries gene *Ls*, which gives it a highly sensitive, frequently lethal reaction when infected with raspberry leaf spot virus (4). Most cultivars are tolerant of this virus and carry it without symptoms: they therefore provide a source of inoculum to infect sensitive ones. In 'Glen Moy' the disease tends to be limited to a few plants on the periphery of plantations and does not spread as extensively as in a more aphid susceptible cultivar such as 'Glen Clova.' More importantly, the cultivar is immune from the common strains of the pollen-borne raspberry bushy dwarf virus and consequently shows neither crumbly fruit nor the reduction in vigour commonly associated with infection by this virus (5).

It is fungal diseases, particularly root rot caused by *Phytophthora fragariae* var *rubi*, that have provided the biggest threat to 'Glen Moy.' Few cultivars have strong resistance to this pathogen, but 'Glen Moy' is particularly susceptible. It is unfortunate that the cultivar was launched in the 1980's when the disease first became serious and spread with such devastation in Britain and Europe. Prospects for the future look better, because propagators now take more precautions to ensure that the disease is not unwittingly spread in the planting material, and more effec-

tive chemicals are available to control it in fruiting plantations.

'Glen Moy' is also particularly susceptible to midge blight, a disease complex caused by the raspberry midge, *Ressehiella theobaldi*, in combination with a range of fungi. The midge lays its eggs in natural splits that occur in the rind of raspberry canes and 'Glen Moy' is vulnerable because its canes produce an abundance of splits early in the season. The feeding sites of the emerging larvae provide gaps in the periderm through which several pathogens which cannot invade intact stems are able to infect. These cause extensive death of the fruiting canes but, unlike diseases caused by root-rot fungi, the new growth is vigorous and healthy and growers have the means to control the midge and restore affected plantations to full production.

The third fungal disease to which 'Glen Moy' is highly susceptible is yellow rust (*Phragmidium rubi-idaei*). This disease occurs too late in the season to cause serious damage in Britain, but it would probably cause premature defoliation if it occurred earlier as it does in some parts of the world.

On the credit side, 'Glen Moy' has good resistance to spur blight (*Didymella applanata*) and cane botrytis (*Botrytis cinerea*) (3), and has a degree of resistance to *Leptosphaeria coniothyrium* (2), which causes cane blight. These resistances are thought to be associated in part with the pubescence and spinelessness of the canes. The fruits show a degree of resistance to grey mould (*B. cinerea*) and good resistance to powdery mildew (*Sphaerotheca macularis*), which, together with their good texture, gives them a good shelf-life.

'Glen Moy' is owned by Plant Breeding International of Cambridge, UK and is protected by Plant Breeders Rights.

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Field Reactions of Strawberry Cultivars and Selections to Anthracnose Fruit Rot, Leather Rot and Gray Mold in Arkansas

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Abstract

Three strawberry field trials, conducted for two years each, revealed differing levels of field susceptibility to three fruit rots among cultivars and selections. 'Earliglow' consistently displayed among the lowest levels of anthracnose fruit rot (incited by *Colletotrichum gloeosporioides* (Penz.) Penz. & Sacc.) and gray mold (caused by *Botrytis cinerea* Pers.:Fr.), and moderate to low levels of leather rot (incited by *Phytophthora cactorum* (Leb. & Cohn) Schrot.), in all three trials over both years. 'Vantage' exhibited low levels of all three rots during two seasons in one trial, and NC4052 and USB301 appear promising as rot-resistant selections after one season's data in one trial. 'Guardian' and 'Cardinal' proved susceptible or very susceptible to all three rots, 'Allstar' demonstrated high susceptibility to leather rot and gray mold, 'Lateglow' was very susceptible to anthracnose and gray mold, and 'Badgerglo' exhibited high susceptibility to anthracnose. 'Fairfax' and 'Tri-star' appeared resistant to gray mold during seasons with low gray mold pressure but fully susceptible during seasons with high gray mold pressure, and exhibited moderate levels of anthracnose and leather rot. 'Chandler' exhibited less of all rots than the other California cultivars, 'Fern', 'OsoGrande', 'Pajaro' and 'Yolo', which were very susceptible to anthracnose and leather rot and moderately susceptible to gray mold.

Introduction

Several fruit-rotting fungi attack strawberries, often causing severe pre- and postharvest losses. Chemical control of fungal rots often proves ineffective, may pose human health risks, and has induced development of fungicide-resistant strains of several strawberry pathogens (8, 15). Variation exists within cultivated strawberry germplasm for reactions to several fruit rots, although field rot ratings are highly influenced by environmental conditions including region, weather, and season (3, 5, 9). Field trials over several years could enable selection of cultivars and breeding lines with greater rot resistance within a region, and commercial and breeding use of these genotypes could minimize losses and the need for fungicides.

Three strawberry fruit rots are prevalent in Arkansas and much of the eastern United States: anthracnose, leather rot and gray mold. Several

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