

SABAL BERMUDANA L.H. BAILEY (THE SABAL PALM) – THE OLDEST PALM AT THE ROYAL BOTANIC GARDEN, EDINBURGH

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ABSTRACT

Sabal bermudana, known as the Sabal palm, is, at over 200 years of age, frequently listed as the oldest living specimen growing at the Royal Botanic Garden Edinburgh (Bown, 1992; Fletcher & Brown, 1970; Govier *et al.*, 2001; Rae, 2011; RBGE, 2012). Edmondson & Rowley (1998) even speculated that the Sabal dated from John Hope's time as Regius Keeper of RBGE between 1760 and 1786. However, the earliest date most commonly cited is 1822, the year that the plant was transferred, along with much of the collection, from the Leith Walk garden to RBGE's current site at Inverleith. This article is a summary of its history and cultivation, and offers a description of recent horticultural activities to replace existing supports using novel and possibly unique materials.

HISTORY OF SABAL BERMUDANA AT THE ROYAL BOTANIC GARDEN EDINBURGH

The earliest cited date for the Sabal palm in the Living Collections at the Royal Botanic Garden Edinburgh (RBGE) is 1822. The earliest mention of this date is in an account of *Sabal umbraculifera* (a synonym of *S. bermudana*) in the Palm Stove at Edinburgh which James McNab delivered to the Botanical Society of Edinburgh in December 1874. The account was published in *The Gardeners' Chronicle* (McNab, 1874) soon after, and featured the woodcut image in Fig. 1 reproduced from the original glass plate (Fig. 2). The account noted that the Sabal palm had arrived at Inverleith in 1822 from Leith Walk and had then spent the next 13 years in a lean-to glasshouse. The plant had suffered from the lack of space, the lean-to being only 18ft (5.5m) at its highest point. The Sabal was moved in 1835 into the Octagonal Palm House (now the Tropical Palm House), constructed a year earlier, where, according to McNab, it thrived.

Professor John Hutton Balfour read a description of *Sabal umbraculifera* to the Botanical Society of Edinburgh as the plant was in fruit (Anon., 1850). The palm was described as having a stem of 9–10ft (2.7–3m) and 30 fronds 12ft (3.6m) in length.

In 1858 Professor Balfour wrote that the Sabal, together with other palms, had been moved into the new Palm House (now the Temperate Palm House) by James McNab and his team. Balfour estimated that the Sabal and its rootball must have weighed

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Fig. 1 Line drawing from the glass image published in *The Gardeners' Chronicle* (McNab, 1874). Photographer unknown, RBGE Archives.



Fig. 2 Sabal palm in tub c. 1874. Photographer unknown, RBGE Archives.

somewhere in the region of 7 or 8 tons (7.11–8.12 metric tonnes) and measured 30ft (9.1m) including the height of the tub (Balfour, 1858).

Then, in 1874, James McNab and his team moved the Sabal back into the Octagonal House (Figs 4 & 5). In his article McNab (1874) stated the plant was now 36ft (10.9m) tall from the surface of the floor, with a stem of 14ft (4.2m). He also estimated that the plant was at least 60 years old.

As well as the celebrated living specimen there are also two herbarium specimens of cultivated origin, one filed under *Sabal umbraculifera* (Fig. 3), with the annotation *Corypha Hort. Edin.*, and a second from Glasgow University herbarium, which is on permanent loan to RBGE, filed under *Corypha umbraculifera* and annotated *cult. Dr. Daniel Rutherford*. The Glasgow University specimen is an exciting find as there are very few herbarium specimens directly attributable to Professor Daniel Rutherford during his time as Regius Keeper of RBGE between 1786 and 1819.



Fig. 3 This photograph was labelled *Sabal blackburnianum* c.1900–1906, but is the plant now known as *S. bermudana*. Photo: David Sydney Fish, RBGE Archives.

ORIGINS OF THE SABAL PALM AT THE ROYAL BOTANIC GARDEN EDINBURGH

McNab's estimate in 1874 that the Sabal was around 60 years old places it in the collection around 1814, near the end of Rutherford's time and eight years before RBGE moved from Leith Walk to Inverleith. However, this does not necessarily mean that the plant was raised from seed at RBGE. Rutherford could well have acquired it as a young plant. Regardless of this, McNab's estimate and the Glasgow University herbarium specimen annotated by Dr Rutherford push the date of the Sabal at least as far back as 1819, the final year of Rutherford's life.

The RBGE Archive holds donation books started in 1810 by William McNab, Principal Gardener at the time and father of James. These handwritten books were used to record seed and plant acquisitions. Each entry details the donor, the botanical name, where the material originated and when it was received. A survey of the donation books (McNab, 1810–1817 and McNab, 1810–1820) did not yield any entry for either a *Corypha* or a *Sabal* species entering the collection.

Another possible source of information that omitted a specific reference to the Sabal was Patrick Neill's survey of Scottish gardens and orchards (1813 & 1814). In the small section on RBGE, in which he specifically referred to two of John Hope's plants, he

wrote: 'Two of the Palmae are now splendid plants; *Cycas circinalis*, or Sago palm and *Phoenix dactylifera*, or the Date palm.' Neill's wording implies that there were more than just the two Palmae listed and therefore the *Sabal* may have been too young for Neill to consider worthy of mention.

Professor Rutherford's handwritten teaching notebooks (1778 & 1790) held in the Archive at RBGE were also checked for any mention of *Sabal* or *Corypha*. These notebooks list the plant species from the collection that Rutherford used on a particular day of his botany classes. However, there is only a single reference to Palmae being used in the classes and the entry specifically cites multi-stemmed varieties. Given the dates of these notebooks, even if Rutherford had acquired the *Sabal*, it would have presumably been too small and immature a plant to feature in his classes.

Going back further, John Hope's notebooks state that there were only two palms that were used for teaching purposes and neither could be the *Sabal*.

As the *Sabal* is not recorded in McNab's accession books which start in 1810 this may mean that the *Sabal* has been in the collection at RBGE since before 1810, again pushing back the date and therefore increasing the age of the *Sabal* palm.

There is very little information on this accession in RBGE's collections database, *BG-BASE*TM. The only useful piece of information recorded in the accessions table is that the plant was recorded as *Sabal blackburniana* in 1969 when a mass accessioning was undertaken and all plant records were transferred to the computerised system.

When the name *Sabal bermudana* was originally published the author, L.H. Bailey (1934), believed that the names *Sabal blackburniana* (Fig. 3) and *Corypha umbraculifera* were misapplied names for this species from the horticultural trade in Britain and Germany respectively. Interestingly the misapplied 'German name', *Corypha umbraculifera*, is the same as that found on the Glasgow herbarium specimen attributed to Rutherford. This opens up the possibility that the source of the plant was a German botanic garden or nursery. McNab's seed and plant donation books (1810–1820) record many accessions of living plants and seed entering the collection from sources in Germany between these dates. A German source for the *Sabal* is entirely feasible with Leith's position in the late 18th and early 19th centuries as a major trading port with northern Europe and the Baltic.

Unfortunately we may never know exactly when the *Sabal* palm entered the collection, nor where it came from. However, it is testament to the skill of successive generations of horticulturists at RBGE that after 191 years at the Inverleith site and potentially more than a decade at the Leith Walk site before that, the *Sabal* palm is still alive and well in the collection.

HISTORIC AND CURRENT CULTIVATION AT RBGE

McNab's (1874) account details the effort put in to repotting and moving the *Sabal* palm. The plant had been growing in the same position since 1858 in a round wooden tub with a circumference of 22ft (6.7m) and a depth of 4ft 9 in. (1.4m). After 17 years

in constant heat and humidity the base had rotted away, leaving a mass of roots resting on the stone floor. McNab and his team lifted the plant 5in. (12.7cm) off the floor then placed the rootball onto boards sitting on top of iron rollers. This was achieved using only two planks of wood 8ft (2.4m) long and 10in. (25.4cm) wide to lever the plant into position. The plant was then moved to the centre of the Octagonal House using a block and tackle to pull it and the boards over the rollers.

Once the plant was in position, a new box measuring 7ft 10in. (2.38m) square and 5ft (1.5m) deep was constructed around the rootball. Finally, 'sufficient drainage was added to the box and filled with old turfy loam' (McNab, 1874).

The height of the Tropical Palm House has always been an issue as there is very little that can be done to stop palms outgrowing the structure. Patrick Neill (1813; 1814) noted that the 29ft (8.8m) specimen of *Dracaena draco*, planted by John Hope, had been chopped down. Neill had suggested saving what was then the largest specimen in Europe, at double the size of the same species at the Royal Botanic Gardens, Kew, by raising the roof of the Stove House at Leith Walk. As this was not done the plant had been lost for the sake of £100, which Neill felt was a national travesty.



Fig. 4 Octagonal Palm House Roof c. 1854, showing palm fronds growing through the top. According to the annotation on the back of this print the image was sent to London as a dernier appeal [sic] which succeeded in ensuring the approval of funds for the new Palm House for Edinburgh in the middle of the Crimean War, 12 April 1856. Photographer unknown, RBGE Archives.

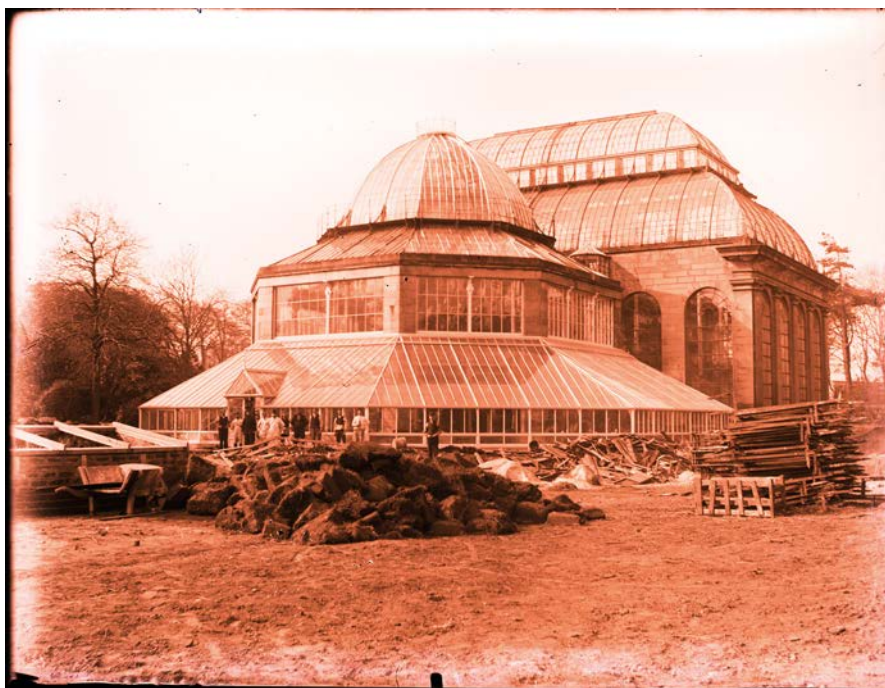


Fig. 5 Tropical Palm House 1893, following the addition of the skirt. Photo: David Sydney Fish, RBGE Archives.

There is an image dating from 1854 that shows palm fronds breaking through the roof of the Octagonal Palm House (Fig. 4). Presumably RBGE management in the 1850s were aware of Neill's criticism of 40 years earlier and, as Victorians were more than willing to tackle complicated engineering projects of this nature, they replaced the wooden roof of this structure adding a cast-iron dome that created an extra 50ft (15m) of height. This work was started in 1859 and completed in 1860 (Fletcher & Brown, 1970).

Further work was carried out on the Tropical Palm House in 1890 to add a 'skirt' (Fig. 5), which has since been removed. It was probably around this time that the *Sabal* was removed from the large wooden tub in which it was growing and planted into the ground, although we can find no record of this. This method of cultivating large palms in equally large wooden tubs, although no longer practised at RBGE, can still be seen at De Hortus Botanicus in Amsterdam and many other traditionally managed palmhouses and glasshouses.

CULTIVATION

The growing conditions in the Tropical Palm House at RBGE are given in Table 1.

The beds in the Tropical Palm House, including the *Sabal bermudana* bed, are top dressed annually with a mix of RBGE's own composted green waste and a commercially

Temperature		Relative humidity	
Maximum	Minimum	Maximum	Minimum
30°C	18°C	70+%	40%

Table 1 Temperature and relative humidity of the Tropical Palm House.

produced composted bark. Pruning is carried out annually in the Tropical Palm House. A scaffold platform is constructed to enable the removal of dead fronds from the stem. This is the only maintenance pruning done to the Sabal palm.

Cockroaches live in the canopy but do not cause significant damage and it has been noted on occasion that grey squirrels will also build a drey in the canopy. The palm is not particularly affected by pests and does not require any specific treatments.

The Sabal palm produces some viable seed and seedlings can be found germinating in the glasshouse. One of these is being grown on in the Living Collection.

RECENT WORKS

Unfortunately, time is running out for the Sabal palm, with only an estimated 3–4.5m between the crown of the plant and the top of the glass dome in the Palm House. Nowadays there is no scope for raising the roof of this A-listed building, unlike in Victorian times. Current estimates by the Horticultural staff give the Sabal palm 10 to 20 years before it will have outgrown the Tropical Palm House and will have to be removed. In the meantime they are striving to ensure the Sabal's longevity as best they can.

At the end of February 2013 work was carried out to improve the stability of the Sabal palm as there were concerns about the lean caused by the weight of the canopy and the ability of the existing cable bracing to continue to prevent the plant from falling. The lean is caused by the palm growing in a protective environment where it is not exposed to environmental stresses; in addition, the severe hurricane winds that would thin and reduce the weight of the canopy in its native Caribbean are absent.

The southerly lean of the Sabal palm was causing the crown and growing point to move towards the side of the glass dome rather than the apex of the Tropical Palm House. The pressure exerted by the expanding frond has caused panes of glass to break in the past. This is a safety concern as the Tropical Palm House is open to the public and is visited by over 50,000 people per year.

The Indoor Horticultural team carried out work to reduce the weight of the crown by removing a number of fronds and fruit clusters. For the first time an elevated work platform was used instead of scaffolding. This ensured that the work could be completed more quickly, reducing the time that the glasshouse was closed to the public.

Upon inspection it was decided that the old cable bracing should be replaced, and the Arboricultural Team was asked to source and install a new support system. Traditional

palm guying and propping was not suitable due to the size and location of the Sabal palm so cable bracing was again the preferred method of support.

Following discussions it was decided that the Sabal palm should be supported at a similar height to the old bracing with additional new bracing just below the crown (Fig. 6). However the height of the second brace was dictated by the cast-iron pillars that support the roof of the Palm House. The second brace is in place to prevent the bowing effect that could occur with a single support. The weight of the crown is so great that the stress on the stem could cause it to fall at the single brace point. Other palms at RBGE have fallen due to similar stem stress. A specimen of *Howea forsteriana* fell in 2012, although luckily it did not cause injury to any people, buildings or other plants.

To support the Sabal palm in all directions the Arboricultural team decided that a tripartite system of cables at both specified heights would suffice (Fig. 6). A structural engineer was consulted to ensure that the cast-iron columns which support the Palm House roof could continue to take the weight of the Sabal palm. A collar with three attachment points was needed which could attach the cabling to the stem. However, this could not be found and so a decision was made to have a bespoke system produced. The simplest solution came from discussions with The Sail Doctor of Port Edgar, just outside Edinburgh. The suggested solution was a system of Velcro straps similar to those used on boats to hold sails in place. This novel method for bracing plants involved



Fig. 6 The new system positioned below the old collar. Photo: Paul Mullany.



Fig. 7 The upper collar and one of the cables. Photo: Paul Mullany.

wrapping a strap around the stem or column and threading delta links into the wraps where they were needed (Fig. 7). As long as there was at least one full wrap of Velcro after the last delta link, the solution would provide a strong point of attachment for the cables.

It proved to be an inexpensive and easy system to install. The Arboricultural Team has been so impressed by the solution that they are investigating how they can use it as part of a non-invasive tree bracing system for other plants at RBGE.

If this is successful it is hoped that the Sabal palm will still be alive for at least another 20 years, thus allowing the 200th anniversary of both this venerable specimen and RBGE's move from Leith Walk to Inverleith to be commemorated.

ACKNOWLEDGEMENTS

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