



Pathfinder Honour: Trainer's Notes

Wattles



Instructions to Trainers / Instructors of this Honour

Thankyou for being involved with this Honour. These notes have been developed to assist in teaching / instructing this honour. We recognise that there is much more information available and we are grateful that you should share your expertise.

Please remember that Honours are designed to develop our Pathfinders in many ways; their interests, their knowledge and their relationship with their Saviour and Creator. Your enthusiasm and creativity will have a huge impact on those doing the honour.

To complete an Honour, the following (where applicable) must be completed satisfactorily:

- Physical and Practical Requirements.
- Honour Workbook.
- Honour Assessment Sheet. *(On SPD Honour Website but Leader's level access is required)*

Additional Reference Material

Please see references in the text of these Trainer's notes

Acknowledgements

Special thanks to Jim Thomas of the North American Division of SDA who compiled the Trainer's Notes at http://en.wikibooks.org/wiki/Adventist_Youth_Honors_Answer_Book/Nature/Wattles. Please note that material on all Wikibooks 'Adventist Youth Honors Answer Book' sites is 'free' and very useful, but such material is beyond the control of the SPD'. For a definition of 'free' and Wikibooks copyright conditions, please refer to Wikibooks [GNU Free Documentation License](#) and [Copyrights](#) for details.

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REQUIREMENT 1: What is the approximate number of named varieties of wattles in Australia?

There are roughly 1300 species of Wattles worldwide, about 980 of them native to Australia, with the remainder spread around the tropical to warm-temperate regions of both hemispheres, including Africa, southern Asia, and the Americas. Wattles are trees and shrubs belonging to the genus *Acacia* of the mimosa subfamily of the legume (*Fabaceae*) family.

REQUIREMENT 2:

a. What are phyllodes?

Phyllodes are modified leaf stems (also called petioles). In some plants, the petioles become flattened and widened, and the true leaves may become reduced or vanish altogether. Thus, the phyllode comes to serve the purpose of the leaf. Phyllodes are common in the genus *Acacia*, especially the Australian species, at one time put in *Acacia* subgenus *Phyllodineae*. Sometimes, especially on younger plants, partially formed phyllodes bearing reduced leaves can be seen.



Acacia koa with phyllode between the branch and the compound leaves.
Note. Although this acacia is native to Hawaii, it illustrates very well what happens to many Australian Acacias

b. What work do they do for the plant?

In *Acacia koa*, the phyllodes are leathery and thick, allowing the tree to survive stressful environments. The petiole allows partially submerged aquatic plants to have leaves floating at different depths; the petiole being between the node and the stem.

The vertical orientation of the phyllodes protects them from intense sunlight, as with their edges towards the sky and earth they do not intercept light as fully as horizontally placed leaves.

c. Why are phyllodes so important in the study of acacias?

Phyllodes are important in the study of acacias because they are distinctive and can therefore be used to determine which species an acacia belongs to.

'Phyllode details are important as they are used as "key" characters in identification. Some important things to note are size and shape of the phyllodes, the type and number of veins, whether penni- or net-veins, length of leaf stalk and gland position.' - Marion Simmons, Association of Societies for Growing Australian Plants (ASGAP)

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REQUIREMENT 3: How are acacias classified into two major groups?

Acacia leaves come in two major forms: bipinnate, and phyllodes.



Acacia seyal, showing bipinnate leaves



Acacia leprosa, (Cinnamon Wattle) showing phyllodes



Acacia koa showing both phyllodes and bipinnate foliage

Pinnate leaves are compound, consisting of leaflets. The word pinnate comes from the Latin word pinna for "feather". In fact, the word pen shares this origin, as the first ink pens were made from feathers. In bipinnate leaves, the leaflets have leaflets of their own, as in the top image to the right.

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Thus, the phyllode comes to serve the purpose of the leaf.

Some Acacia's have bipinnate foliage at the ends of the phyllodes. These are usually classed with the acacias with phyllodes.

REQUIREMENT 4: How does the shape of the seed pod and the way the seeds lie in the pod help in identification?

Some species of acacia are difficult to tell apart. They may be identical in every other outward appearance, but have starkly (or subtly) different seed pods. For example *Acacia farnesiana* (Farnesian Wattle) and *Acacia pulchella* (Western Prickly Moses) look very much alike, but the seed pods are different.

Acacia pods may be curled, withered, straight, long, short, or in between. The seeds may lie in the pods sideways (transversal) or lengthwise (longitudinal).

REQUIREMENT 5: How many acacias in your state have true leaves (bipinnate) when adults?

There are three subgenera of *Acacia* that retain bipinnate leaves when fully grown, namely *Botrycephalae*, *Pulchellae*, and *Aculeiferum*.

State	<i>Botrycephalae</i>	<i>Pulchellae</i>	<i>Aculeiferum</i>	Total
New South Wales	36	1	0	37
Northern Territory	1	0	1	2
Queensland	20	0	1	21
South Australia	5	1	0	6
Tasmania	4	0	0	4
Victoria	13	0	0	13
Western Australia	5	26	0	31

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REQUIREMENT 6:

a. In seeding acacias what is seen first, true leaves or phyllodes?

The first leaves to emerge from an acacia sprout are true leaves. In plants that will develop phyllodes, the true leaves persist until the plant is about a meter tall.

b. How many acacias have true leaves?

In Australia, the great majority of acacias develop phyllodes. For example, in New South Wales, which hosts 230 native species of acacias, only 17% have true leaves. However, acacias with phyllodes are native only to Australia.

REQUIREMENT 7: What must happen to an acacia seed before it will germinate and grow?

Before an acacia seed can germinate, the seed coat must be cracked. This can happen by any of several methods, but in nature, fire is the most common. This can be simulated by pouring boiling water over the seeds and letting them soak overnight. The seeds most likely to germinate become swollen. People who grow wattles can crack the seed coats themselves using a three-cornered file. Seed coats can also be cracked by being run over by heavy machinery during construction projects, or by other physical stresses.

REQUIREMENT 8: What acacias are used to feed stock in times of drought?

The phyllodes of the *Acacia cyanophylla* (Blue Leaf Wattle) have been used to feed sheep during times of drought.

Acacia aneura (Mulga) is known as the "King of Fodders".

Sheep and other livestock are exceedingly fond of *Acacia pendula* (Myal or Boree Wattle) especially in times of drought. For this reason, it has nearly been extirpated from parts of some states. Other useful stock fodder acacias are:

- *Acacia hakeoides* (Western Black Wattle)
- *Acacia homalophylla* (Yarran) grows in desert areas

REQUIREMENT 9: What is the bark of some acacias used for in Australia?

The bark of various Australian species, known as wattles, is very rich in tannin and forms an important article of export; important species include *Acacia pycnantha* (Golden Wattle), *Acacia decurrens* (Tan Wattle), *Acacia dealbata* (Silver Wattle) and *Acacia mearnsii* (Black Wattle).

REQUIREMENT 10: What species of acacias are used for furniture making?

Most acacia species are used for valuable timber; such are *Acacia melanoxylon* (Blackwood) from Australia, which attains a great size; its wood is used for furniture, and takes a high polish; and *Acacia omalophylla* (Myall Wood, also Australian), which yields a fragrant timber, used for ornamental purposes.

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REQUIREMENT 11: How do acacias help and benefit man, animals, insects, birds?

Food uses

Acacia seeds are often used for food and a variety of other products. In Burma, Laos and Thailand, the feathery shoots of *Acacia pennata* are used in soups, curries, omelettes, and stir-fries.

Tim Low in 'Wild Food Plants of Australia' (Angus & Robertson, 1991) pages 179, 180 states that acacia seeds, especially those from *Acacia aneura* (Mulga) were an important food source for outback Aborigines. Seeds were gathered, roasted and ground to a paste which is said to have tasted like peanut paste. The seeds were very nutritious (18-25% protein) and sometimes with high levels of fat. After good rainfall, the seed was so abundant that large groups could be supported.

In addition to the seeds, Tim Low (page 152) also notes that the sweet, soft, pale gum which oozed from notched acacia trunks and branches was a delicacy. It is said that Aboriginal women pressed the gum into balls 'as big as a child's head' and, in Victoria, individual trees were 'owned' by individual Aborigines.

Honey made by bees using the acacia flower as forage is considered a delicacy, appreciated for its mild flowery taste, soft running texture and glass-like appearance. Acacia honey is one of the few honeys which does not crystalize.

Acacia is listed as an ingredient in Fresca, a citrus soft drink, and Barq's root beer, as well as in Läkerol pastille candies, Altoids mints, and Wrigley's Eclipse chewing gum.

Gum

Various species of acacia yield gum. True gum arabic is the product of *Acacia senegal*, abundant in dry tropical West Africa from Senegal to northern Nigeria.

Acacia arabica is the gum-Arabic tree of India, but yields a gum inferior to the true gum-Arabic.

Medicinal uses

Acacia tetragonophylla (Dead Finish or Prickly Wattle) an extremely tough, thorny desert-living wattle was used by Aboriginal people to treat warts, sores, boils and cuts. See <http://asgap.org.au/APOL14/jun99-2.html>

Many Acacia species have important uses in traditional medicine. Most all of the uses have been shown to have a scientific basis, since chemical compounds found in the various species have medicinal effects.

A 19th century Ethiopian medical text describes a potion made from an Ethiopian species of Acacia (known as *grar*) mixed with the root of the *tacha*, then boiled, as a cure for rabies.

An astringent medicine, called catechu or cutch, is procured from several species, but more especially from *Acacia catechu*, by boiling down the wood and evaporating the solution so as to get an extract.

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Ornamental uses

A few species are widely grown as ornamentals in gardens; the most popular perhaps is *Acacia dealbata* (Silver Wattle), with its attractive glaucous to silvery leaves and bright yellow flowers; it is erroneously known as "mimosa" in some areas where it is cultivated, through confusion with the related genus *Mimosa*.

Another ornamental acacia is *Acacia xanthophloea* (Fever Tree). Southern European florists use *Acacia baileyana*, *Acacia dealbata*, *Acacia pycnantha* and *Acacia retinodes* as cut flowers and the common name there for them is mimosa.

Ornamental species of acacia are also used by homeowners and landscape architects for home security purposes. The sharp thorns of some species deter unauthorized persons from entering private properties, and may prevent break-ins if planted under windows and near drainpipes. The aesthetic characteristic of acacia plants, in conjunction with their home security qualities, makes them a considerable alternative to artificial fences and walls.

Soil Conservation and Improvement

As wattles are in the legume family, most fast-growing wattles convert nitrogen in the air to nitrogen in the soil. In addition, wattles such as *Acacia parramattensis* (Parramatta Wattle) are planted to reduce erosion, particularly on construction and reclamation sites.

Paints

The ancient Egyptians used Acacia in paints.

Perfume



Acacia farnesiana (Farnesian Wattle) is used in the perfume industry due to its strong fragrance.

The use of Acacia as a fragrance dates back centuries. In The Bible, burning of acacia wood as a form of incense is mentioned several times.

Other Uses

Acacia is also used for lumber and as a source of tannin, but these qualities are discussed elsewhere in this chapter, so we will only mention them here

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REQUIREMENT 12: Make a collection of 10 or more dried pressed wattles with flowers and phyllodes and where possible pods and seeds. Show dates, place collected, common and scientific names. Some must be spike type flowers, some raceme type (ie spikes of flower) or single balls and some bipinnate leaves.
Or,
20 or more close-up photographs you have taken of wattles showing the above details.

The best approach to this requirement is to go out into the field and find some wattles - then identify them. There are numerous books and CD ROMs available for purchase that will help in identifying the various species. There are also a few dichotomous keys online plus very useful sites associated with wattles. Please see the following.

Keys to Acacias of South Australia Using a Dichotomous Key.
http://www.flora.sa.gov.au/id_tool/acacia.html

Key to the Wattles of the Greater Brisbane Area
http://www.epa.qld.gov.au/publications/p00723aa.pdf/Key_to_the_wattles_of_Greater_Brisbane.pdf

World wide wattle which has extensive information on the wattle genus
<http://www.worldwidewattle.com/infogallery/>

Photographs of Australian Wattles - genus Acacia, Australian National Botanic Gardens, Australian National Herbarium
<http://www.anbg.gov.au/acacia/photo-list.html>

Association of Societies for Growing Australian Plants (ASGAP)
Acacia - Further Information, including excellent links to Acacia sites
<http://asgap.org.au/acacia6.html>