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The use of Fir Taxa in Planting Design

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Abstract

Fir is widely distributed in the mountainous regions of our country as a natural and very aesthetic plant owing to their forms, beauty of leaf characteristics and cones. They offer significant opportunities to the designer by single or group use in planting design of landscape architecture. Due to these features they are used intensively in parks and gardens in many countries of the world. Firs are used more as forest species in our country and are found in the green urban areas in rare cases.

In this study we aim to determine the aesthetic and functional uses of fir taxa in planting design as well as encouraging the use in parks and gardens by particularly drawing attention to the natural fir of Turkey.

Keywords : *Abies* taxa, Fir, Planting Design, Natural Plant, Landscape Architecture

Introduction

Abies genus is a member of *Pinaceae* family. It is a genus of about 50 evergreen trees known as firs, located mostly in the mountain areas. Firs are widely distributed in the northern hemisphere (Beckett, 1985, Hillier and Coombes, 2002). The majority of them are from China and western North America, but a few species extend into the tropics on the high mountains of Central America and Southeast Asia (Warren, 1999). Among the list of all conifers, firs come from cool to cold-climate mountain areas of the northern hemisphere (Warren, 1999). Generally, firs prefer mountain and sea climates with high air humidity. They are shade-resistant and grow well on nutrient-rich, deep and light sandy loam soils (Pamay, 1992). The hot and dry summers which occur in the midwest and south tend to limit their landscape usefulness. Firs are not suited for city plantings and do not tolerate air pollution. In youth they are mostly conical and extremely symmetrical in shape, and some types may grow over 50 m tall (Dirr, 1998). They have erect cones which break up while still on the tree. The majority of species are conical in shape, at least when young, the branches borne in more or less regular whorls, flattened in a horizontal manner. The needles are linear and usually flattened, bearing several grayish white lines of stomata on their lower surface and, in some species, on the upper surface too. The cones are borne on the upper side of the branches and, in many species, are attractive blue-purple or violet when young (Hillier and Coombes, 2002). Firs have central, erect trunks and whorls of branches in tiers, forming narrowly conical or columnar trees (Beckett, 1985). Because of these decorative characteristics, firs are very important in planting design of Landscape Architecture with aesthetic and many functional uses.

Native Firs in Turkey

Firs introduced in the northern hemisphere are especially grown naturally in Turkey.

Native firs in Turkey have 2 taxa and 5 subspecies (Anşin, 1993):

Abies nordmanniana
Abies nordmanniana subsp. *nordmanniana*
Abies nordmanniana subsp. *bornmülleriana*
Abies nordmanniana subsp. *equi-trojani*
Abies cilicica
Abies cilicica subsp. *cilicica*
Abies cilicica subsp. *isaurica*

Abies nordmanniana (Caucasian Fir)

It is distributed in the west Caucasus and north Anatolia [Artvin (Ardanuç, Şavşat, Yusufeli), Trabzon (Sürmene), Gümüşhane (Torul), Giresun (Espiye, Mesudiye, Şebinkarahisar)] (Schütt et al., 2008) (Figure 1).

Figure 1. *Abies nordmanniana* in Eastern Black Sea Forests (Var, 2008)

They can grow to 40-50 m in height and 6-8 m in crown diameter. They have a broad pyramidal crown. They have grey-brown bark (Pamay, 1992). Their branches are in symmetrical whorls, wide spreading to hanging and even in maturity growing to the ground. Owing to this appearance they are stately trees. They have glossy dark green leaves (Figure 2). Their young cones are green and become dark brown when ripe (Figure 3). They are generally disease-resistant species.

Figure 2. The cones of *Abies nordmanniana* (Var, 2008)

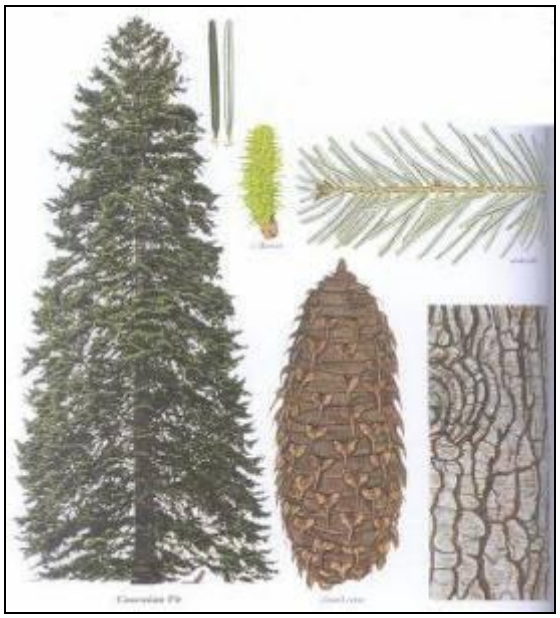

Figure 3. The general shape, needles, flower, cone and bark of Caucasian Fir (More and White, 2002)

They are important species for large gardens and parks. Some of their cultivars are:

Abies nordmanniana cv. "Brevifolia"
Abies nordmanniana cv. "Aurea"
Abies nordmanniana cv. "Tortifolia"
Abies nordmanniana cv. "Pendula"
Abies nordmanniana cv. "Golden Spreader"
Abies nordmanniana cv. "Robusta"

***Abies nordmanniana* subsp. *bornmülleriana* (Uludağ Fir)**

It is a tree specific to Turkey. It grows in West Karadeniz Mountain between north Anatolia and Kızılırmak. They can reach 40 m in height and 4-6 m in crown diameter. They have a pyramidal shape (Figure 4).

Figure 4. The form of *Abies nordmanniana* subsp. *bornmülleriana*

Their cones are 15-20 cm long (Pamay, 1992) (Figure 5). When they are used solitary or as a group, they have a great impact.

Figure 5. The cones of *Abies nordmanniana* subsp. *bornmülleriana* (Var, 2008)

***Abies nordmanniana* subsps. *equi-trojani* (Kazdağı Fir)**

It is distributed in Çanakkale-Kazdağı and can grow to 20-25 m in height and 6 m in crown diameter. They have cylindrical cones 15-20 cm long (Pamay, 1992) (Figure 6).

Figure 6. The beauty of young cones of *Abies nordmanniana* subsp. *equi-trojani* (Mamıkoğlu, 2007)

***Abies cilicica* (Toros Fir, Cilician Fir)**

It comes from southern Turkey, parts of Syria and the Lebanon - a southern extension of the range of the closely related Caucasian Fir. It can reach 30 m in height (More and White, 2002). Toros firs are distinctly columnar-spire like, varying very little from base to apex in width (Figure 7). The large erect cones are 15 to 25 cm long, cylindrical and reddish brown (Dirr, 1998).

The Use of Fir Taxa in Landscape Architecture

The success of a good planting design depends on the selection of valuable plant species and design. These features of the plants are main factors that affect the aesthetic quality of the planting design. Plants that are in harmony with each other can be combined considering the aesthetic and functional size, form, texture and color features.

Firs strengthen the design of planting. There are many cultivars among the various species including prostrate, compact, pendulous, contorted, fastigiated, pyramidal, yellow-foliaged and blue-foliaged types. Fir cultivars with these different textures, colors and shapes are highly decorative and can be used in many ways in landscape planning.

Figure 7. The form of *Abies cilicica* (Mamıkoğlu, 2007)

The color of a plant or plant mass is the visual property that is dependent on the wavelength of the light reflected from it. It is the most striking of all the planting design elements. It can attract attention, influence emotions, create atmosphere, or produce specific effects in a composition (Austin, 2002). In design, especially in sunny climates, leaf color is lighter and brighter, evoking a strong emotional response of beauty.

Colorful leaf plants are firstly perceived in the plant composition. Such plants show the effect of better when used with plants with evergreen dark-colored and non-variegated leaves. Firs have cultivars with aesthetic colorful leaves in large quantities (Figure 8). The use of these cultivars creates very successful compositions in planting design.


Abies nordmanniana "Golden Spraeder" (Var, 2008)

Abies concolor "Winter Gold"
(Gelderen and Smith, 2002)

Abies koreana "Silver Show"
(Gelderen and Smith, 2002)

Abies koreana "Luminetta"
(Gelderen and Smith, 2002)

Abies procera "Jeddeloh"
(Gelderen and Smith, 2002)

Figure 8. Fir cultivars with aesthetic colorful leaves

The form is very important in planting design. It refers to the shape and structure of a plant or plant mass. The trunk, branches and leaves together create a form. Plants in the landscape have a distinct form that establishes its functional characteristics.

If a plant is tall and slender, it is said to have vertical form. If it is low and spreading, it is said

to have horizontal form. A bunch of vertical plants may be grouped together in sufficient quantity so that the length of the group is greater than the height and thus creating a horizontal form (Walker, 1985).

Fir cultivars with different forms create highly aesthetic view. Compact and horizontal fir forms better show the effects of a combination of plants used in the pyramidal and columnar forms. These forms can be accented with contrasting shapes. In the same way fastigiated and pyramidal fir cultivars create successful design with compact and horizontal forms. In Figure 9, some examples are shown in terms of forms of different fir cultivars.

Abies alba "Compacta"
(Gelderen and Smith, 2002)

Abies concolor "Compacta"
(Gelderen and Smith, 2002)

Abies balsamea "Globosa"
(Var, 2008)

Abies koreana "Nana"
(Var, 2008)

Abies balsamea "Hudsonia"
(Gelderen and Smith, 2002)

Abies balsamea "Nana"
(Gelderen and Smith, 2002)

Abies amabilis "Spreading Star"
(Gelderen and Smith, 2002)

Abies procera "Prostrate"
(Gelderen and Smith, 2002)

Abies concolor "Conica"
(Gelderen and Smith, 2002)

Abies procera "Sherwoodii"
(Gelderen and Smith, 2002)

Abies veitchii "Pendula"
(Gelderen and Smith, 2002)

Abies concolor var. *lowiana* (Gelderen and Smith, 2002)

Abies bracteata (Gelderen and Smith, 2002)

Abies grandis

Figure 9. Fir cultivars with different forms

In Figure 10, *Abies nordmanniana* subsp. *nordmanniana*, which is one of the native firs in Turkey, is shown. Because it is used in front of a light-colored building its form seems to be quite apparent.

Figure 10. *Abies nordmanniana* subsp. *nordmanniana*

In Figure 11, *Abies nordmanniana* subsp. *bornmülleriana* is shown, emphasizing the entry road with *Hydrangea macrophylla*.

Figure 11. *Abies nordmanniana* subsp. *bornmülleriana*

Cones on the plant, like flowers, increase the aesthetic quality of plants. Plants with cones are very important in planting design. In Figure 12 some examples for aesthetic cones of fir taxa are shown.

Abies numidica
(Gelderen and Smith, 2002)

Abies homolepis
(Gelderen and Smith, 2002)

Abies nordmanniana
(Gelderen and Smith, 2002)

Abies homolepis
(Gelderen and Smith, 2002)

Abies delavayi subsp. *delavayi*
(Gelderen and Smith, 2002)

Abies koreana
(Gelderen and Smith, 2002)

Abies nordmanniana subsp. *equi-trojani*
(Mamıkoğlu, 2007)

Figure 12. Examples of the fir cones beauty

Firs generate taproot since youth and are wind and storm-resistant. Because of these characteristics, when firs are used as a group, they form successful wind screens, barriers and hiding view functionally (Figure 13, 14).

Figure 13. *Abies nordmanniana* subsp. *bornmülleriana* can be considered as a successful wind screen and hiding view

Figure 14. The group planting of *Abies nordmanniana* subsp. *equi-trojani* as a wind screen and barrier (Mamıkoğlu, 2007)

Suggestions

The compositions produced by the joint use of firs and other plants can form aesthetic plans for landscape projects of parks and gardens in terms of tissue, form and leaf color. In landscape planning firs, which are valuable plants in terms of these qualities, form and aesthetics, can be used in urban landscapes. We would like to emphasize that owing to its aesthetic quality and functional uses, this plant should be used in the landscape planning in our country.

References

Anşin, R., Özkan, Z.C., 1993. Tohumlu Bitkiler, Karadeniz Teknik Üniversitesi Genel Yayın No:167 Fakülte Yayın No: 19.

Austin, R.L., 2002. Elements of Planting Design, John Wiley&Sons.

Beckett, K.,A., 1985. The Concise Encyclopidia of Garden Plants, Orbis Publishing Limited.

Dirr, M.,A., 1998. Manual of Woody Landscape Plants, Fifth Edition, Stipes Publishing L.L.C.

Gelderen, D.,M. and Hoey Smith, J.R.P., 2002. Conifers, The Illustrated Encyclopedia, Volume 1, Timber Press.

Hillier, J. ve Coombes, A., 2002. The Hillier Manual of Trees&Shrubs, Davied&Charles.

Mamıkoğlu, N.,G., 2007. Türkiye'nin Ağaç ve Çalıları, NTV Yayınları.

More, D. and White, J., 2002. The Illustrated Encyclopedia of Trees, Timber Press.

Pamay, B., 1992. Bitki Materyali I, Orhan Ofset.

Schütt, Weisgerber, Schuck, Lang, Stimm and Roloff, 2008. Lexikon Der Nadelbäume, Nikol.

Var, M., 2008. Photographs of Collection about Firs.

Walker, T.D., 1985. Planting Design, PDA Publishers Corporation.

Warren, W., 1999. Botanica, Köneman.