

**RESEARCH ON THE SEEDS OF BLACK PINE
(PINUS NIGRA VAR. PALLASIANA)**

By

Dr. İbrahim ATAY

Research of the Institute of Silviculture

Director

Prof. Dr. Fikret SAAFCIOĞLU

Black pine cones, collected from the trees which were grown under natural conditions mature in January and February in Bahçeköy (near Büyükdere). Dissemination of seeds occurs at the end of March and the beginning of April.

Seeds extracted from cones which were collected at monthly intervals between September and March do not indicate any difference between the light and dark percentage, but the sound seed percentage shows an increase towards March although the increase is not very distinguished.

The germination percentage for the seeds extracted from cones collected in September is low. The germination percentage for the seeds extracted from the cones collected between September to March is high with little variations. Seeds extracted from the cones collected in March have the highest germination percentage. Thus it means that Black pine cones can be collected in every month after September, but cones collected in March give the best result.

The length of Black pine cones varies from 30 to 95 mm. The average length is 63,7 mm. The width of the cones varies from 20 to 67 mm., and general average for width is 28,8 mm.

The cones collected from the north and the higher elevations are smaller than the cones collected from the south and the lower elevations.

The weight of cones varies from 5,0 gr to 7,5 gr and the average weight is 20,1 gr (approximate humidity is 22 %).

Cones collected from northern regions, higher altitudes, and under unfavourable steppe conditions, are lighter (the weight of cones) than those collected from the regions where the conditions are more favourable.

The average humidity content of the collected cones were 22,6 % before their scales open, but after the scales of the same cones open (the seeds were released on that time) they had only a 6,9-7,0 % humidity content.

Average number of cones per hectoliter is 2100 (in number) and 37,604 kgr (in weight). Maximum number is 3930, maximum weight is 41,063 Kgr; minimum number is 1208, minimum weight is 32,334 Kgr; in one hectoliter.

In same regions and same forests, number of the cones per hectoliter collected from trees in a stand is more than the number of cones per hectoliter collected from individual trees which are out of the stand.

Three types of cones were observed :

- a. Long cones : where the length of cones is three times of its width.
- b. Conical cones : the length of cone is twice of its width.
- c. Oval cones (the majority) : the length of cone is equal to 1,3 to 1,5 times its width.

The colour of cones differs. The matured Black pine cones are yellowish brown. But some times they have earth coloured.

The **apopheses** on cone scales are different too. The main types that observed are : **Sharp apophesed cones** (they were 17 % in the research material) plain apophesed cones (they were 15 %) and between those two classes which were 67 %.

As when the seeds extracted by exposing the cones to direct sunlight, the average number of seeds extracted from one cone was 26 and their weight was 0,661 gr. Maximum number of seed was 48 and their weight was 1,091 gr. Minimum number of seed was 12 and their weight was 0,224 gr. But if an artificially heated oven were used 67 seeds can be extracted from a considerable big cone.

At the bottom of the cones the first 4 or 5 rows of scales does not have any seeds. In all cones, the middle part of the cone has the most seeds and two ends have less scales and therefore less seeds.

Black pine stands in Turkey, produce good and rich seeds almost every year but every two years they are more abundant.

Cones were opened in 7-10 days by sunlight, 2-3 days by central heating (placed on the radiator).

Opening period were not the same for the cones collected from different region and elevation as well as it was not the same for cones collected from a certain area.

Cones collected in mid-winter and in March were opened in shorter time and better than the cones collected earlier.

Opening had always begun from the scales of the Lower parts of cones and the rest had opened later.

The volume of the opened cones were two or three times of the closed ones.

Average wing length of Black pine seeds are 23,2 mm.

Average wing length of Black pine seeds are 7,2 mm.

The length of the biggest wing is 33,0 mm. The width of it is 11 mm.

The length of the smallest wing is 13,0 mm and its width is 5,0 mm.

The widest part of a wing is always its middle, especially near the seed. From this widest part to the point the wing gets narrower.

The colour of the wings differs from a yellowish-white to dark-brown. But generally the prevalent colour is a shiny brown.

The wings of seeds collected from a tree have the same colour.

There is no relationship between the colour of seeds and the colour of wings. Dark seeds may have light wings and vice versa.

The greater the seed length the greater the wing length.

The amount of winged seeds per hektoliter is :

	in number	in weight
Average	456.915	10.912 Kgr
Maximum	780.000	15.000 »
Minimum	346.400	7.688 »

The comparison of the amount of dewinged seed and winged seed in which the same volume showed that, dewinged seeds are bigger than winged seeds 4,7 times in number and 4 times in weight.

The size of Black pine seeds are below :

	length of seed	width of seed
Average	6,3 mm	3,5 mm
The biggest	8,7 mm	3,8 mm
The smallest	4,2 mm	2,8 mm

The correlation between the length of seeds and the length of cones is $r=0,629$. It means that the bigger the length of cone the bigger the length of seed.

As an average value, the seeds length are smaller 3,7 times than the wing length.

There is not any difference in seed form taken from different origins.

Main seed colours were :

1 — Yellowish white,

2 — Dark grey,

3 — Dark,

4 — Near to black.

Besides those which have only one colour some seeds have two colour and one of these colours is the main one and the other is the equally separated on it as spots.

1000 seed weights is different for the light seeds, mixed seeds and dark seeds. As an average :

1000 seed weight in dark seed is : 24,5 Gr

» » » » mixed seed » : 22,5 Gr

» » » » light seed » : 18,5 Gr

It has been obvious that : if the seeds collected from low elevation 1000 seed weight is high and vice versa.

The number of seeds in 1Kgr. are :

	Winged seed	dewinged seed
Average	40.640	46.174
Maximum	60.957	70.422
Minimum	28.750	32.780

According to the two main colours (dark and light) research material (seeds from different origin) can be easily separated as follows :

	in number	in weight
dark seed	68,1 %	39,4 %
light »	38,1 %	19,8 %

as an average

In the light seeds, as an average, 73,5% are empty and 26,5 % are full. In dark ones 20,1 % are empty but 79,9 are full.

The Steigsichter apparatus which is used to separate the empty and full seeds, has made 1-10 % mistake for individual origin, and as an average 3 %.

Biochemical method (with trephenyl tetrazolium chlorid) can easely be appllied to *P. nigra* seeds, It has been applied to the seeds from differut origins and as a general average, 94,2 % germination capacity has been estimated.

Germination capacity, tested on the three germinators (Rodewald, Jacobsen and germination chamber), has been found out as 91,3 (general average).

Biochemical method gives 3 % higher results than real germination.

Comperative results of the germination test, of the three germination apparates to determire the germination percent, is given below : If we accept the mean value of 3 apparatus' results as an index, germination on the Rodewald ise a little lower but in the Germination chamber is a little higher than this average.

Within the research meterial, minimum germination percent was 75 %, general average 91 %. When the cones and seeds were given a good care, germination percents goes up to 100 %.

Germination of seeds starts on the 4 th and 5 th days and ends on 23 day. In some orgins which shows higher vitality, the results of germination tests have been obtained in 8 days from the begining. If the seeds are soaked into the water just before germination test, in the normal room temerature, germination starts 1 day earlier, but it doesn't mean that germination test will end 1 day before.

The germination percent of seeds which is tested in darkness, is almost the same in light, but : Germination period is longer (3-4 days) and germination energy is low.

The research material which comes from different orgins in germination tests have shown that in the 7 th days the number of germinated seeds arrived the maximum, so 7 th day in the germination test has been taken as main date for estimating the germinative energy.

The germinative energy, obtained from Rodewald germinator is higher than Jacobsen germinator.

The higher the germination capacity and the germination energy the higher the sprouting power.

Using the sand which is smaller than 2 mm in diameter is not convineint as a cover material for sprouting prower test. When smaller sand was used results were 42 % but for normal sand it was 74,4 %.

KARAÇAM (*P. nigra*, Arnold) HACIM TABLOSU

Yazan :

Dr. İlhan GÜLEN

(Orman Fakültesi Orman Hasılat ve İşletme Ekonomisi
Enstitüsü çalışmalarından)

Memleketimizin yerli ağaç türlerinden olan ve geniş bir yayılışa sahip bulunan Karaçam (*P. nigra* Arnold), büyük bir iktisadi önemi de haizdir. Bu sebepten, memleketimizde yapılmakta olan teknik ormancılık çalışmalarına faydalı olacağı mülâhazası ile bu türe ait genel hacim tablosu tanzim olunmuştur.

1 — Hacim tablosunun tanziminde kullanılan materyal :

Karaçam hacim tablosunun tanziminde kullanılan materyal muhtelif yıllarda amenajman ve istikşaf gruplarının seksion metodu ile ölçmüş oldukları deneme ağaçlarıdır. Bu materyalin 2358 adedi Orman Genel Müdürlüğü arşivlerinde mevcut kayıtlardan tarafımızdan çıkarılmıştır. Diğerleri ise 1955 ve 1958 yıllarında Başmüdürlüklerimize bağlı amenajman heyetlerine yazılarak temin edilmiştir. Deneme ağacı yekunu 6295 adettir.

Kullanılan deneme ağaçlarının kesildikleri işletmelerin isimlerini, her işletmeden kesilmiş olan ağaç adedini ve kesilen ağaçların kat'i amenajman plânı maksadı veya I. ci devre istikşaf plânı maksadile kesildiği Tablo: I de görülmektedir.

Ayrıca, Karaçam (*P. nigra* Arnold) in memleketimizde tabii yayılış mntakalarını gösteren ve araştırma materyalinin bu mntakalara adeden dağılışım görmeği mümkün kılan bir harito verilmiştir.

Tablonun tanziminde kullanılan ağaçların adedi ve kesildikleri sahalarmın karaçamın Türkiye'deki yayılış mntakalarını temsil edebilecek

karakterde oluşu, bizi bu materyalle Türkiye için bir genel karaçam hacim tablosu yapılabileceği kanaatine ulaştırmıştır.

Tablo : I — Deneme ağaçlarının kesildikleri işletmeler
Tabelle : I — Klassifizierung der Probestämme nach der Forstämten

İşletme Forstamt	Ağaç adedi Stammzahl	
	Kat'i plândan alınan Aus Forsteinrichtungs- aufnahmen	Aus Forsteinrichtung für erste Periode I, Devre plândan alınan
Acıpayam	—	270
Adana	342	—
Alanya	412	—
Balıkesir	67	—
Bayındır	—	45
Bayramiç	—	160
Biga	174	—
Bolu	206	—
Bursa	81	21
Çankırı	129	—
Çine	—	157
Dursunbey	707	54
Edremit	106	104
Eğridir	673	80
Eskişehir	153	—
Feke	—	302
Göğdes	86	72
İnegöl	37	—
İsparta	73	—
İzmir	38	—
Kastamonu	125	—
Keşan	13	—
Kızılcabamam	255	—
Kozan	—	117
Köyceğiz	—	116
Manisa	27	62
Mudurnu	—	—
Muğla	118	—
Sinav	218	—
Taşköprü	244	—
Tavşanlı	148	—
Uşak	252	43
Toplam	4689	1606

(6295)

(Tablo II) de deneme ağaçlarının çap ve boy kademelerine dağılışı gösterilmiştir. Bu tablonun tetkikinden 30 m. boy ve 79 cm. çap kademelerinden sonraki hacim tablosu kıymetleri için, kaydı ihtiyatla hareket edilmesi gerektiği neticesi anlaşılmaktadır.

Tablo : II — Karaçam (P. nigra Arnold) Hacim tablosunun tanzimine esas olan deneme ağaçlarının çap ve boy kademelerine dağılışı.

Tabelle : II — Verteilung der Grundlagen (stammzahl) auf Höhen- und Durchmesserstufen.

Çaplar Durch- messer cm.	Boylar (m)						Baumhöhe (m)					Yekün Ges. Stz.
	6	9	12	15	18	21	24	27	30	33	36	
7												
10	11	20	4									35
13	13	40	23	8	4							88
16	11	105	85	48	6	2						257
19	10	63	84	58	13	5						233
22	7	50	92	64	32	4	2					251
25	2	60	118	138	71	22	4					415
28		30	95	138	108	74	5	5				455
31		31	82	143	96	53	27	2				434
34		18	52	101	62	47	24	3	3			310
37		23	52	131	87	80	37	11	2			423
40		14	40	66	82	80	35	21	4	1		343
43		12	26	82	92	142	84	29	8	1	1	477
46		9	13	49	72	54	53	21	9	1		281
49		8	20	52	72	70	64	37	15	4		342
52		6	10	36	40	61	28	38	10	1		239
55		6	7	25	61	67	48	45	18	4		281
58		1	6	27	40	59	60	44	22	8	1	268
61		5	5	27	44	66	39	48	16	6	2	258
64			7	11	17	42	32	36	25	6		176
67			5	15	24	40	35	29	8	4	2	162
70			3	11	12	33	17	14	6	6	1	162
73			4	1	10	29	25	16	10	4	2	161
76				4	8	13	16	13	7	3		64
79				5	12	13	13	19	10	2	1	75
83				8	12	20	19	23	12	8		162
89				2	3	10	19	9	5	1		49
95					1	9	8	6	7	5		36
101						9	4	5	4	2	1	25
101 den büyük					2	7	5	2	4	1		21
Yekün												
Ges. Stz. 54	501	833	1250	1083	1111	703	476	205	68	11	6295	

EK TABLO — Karaçam Gövde Hacim Tablosu
ANHANGTABELLE — Schaftholzmassentafel für Schwarzkiefer

Ağaç boyu Baumhöhe m.	G ö ğ ü s ç a p l a r ı c m. Brusthöhendurchmesser									
	7	8	9	10	11	12	13	14	15	16
M e t r e k ü p (Kbl.) Vorratsfestmeter m. R.										
6	0,022	0,027	0,032	0,037	0,043	0,049	0,055	0,060	0,066	0,072
7	0,025	0,030	0,036	0,041	0,047	0,054	0,061	0,067	0,074	0,081
8	0,028	0,034	0,040	0,045	0,052	0,059	0,067	0,074	0,082	0,090
9	0,031	0,037	0,044	0,050	0,057	0,065	0,073	0,081	0,090	0,100
10	0,034	0,041	0,047	0,054	0,062	0,070	0,079	0,088	0,098	0,109
11	0,038	0,044	0,051	0,058	0,067	0,076	0,085	0,095	0,106	0,118
12	0,040	0,048	0,055	0,063	0,072	0,082	0,092	0,103	0,115	0,128
13	0,043	0,051	0,059	0,068	0,077	0,087	0,098	0,110	0,123	0,137
14	0,046	0,055	0,063	0,073	0,082	0,093	0,104	0,117	0,131	0,147
15	0,050	0,058	0,067	0,077	0,087	0,099	0,111	0,124	0,139	0,157
16	—	—	—	—	—	—	0,117	0,131	0,147	0,166
17	—	—	—	—	—	—	0,123	0,138	0,155	0,175
18	—	—	—	—	—	—	0,130	0,145	0,163	0,185
19	—	—	—	—	—	—	0,137	0,152	0,171	0,195
20	—	—	—	—	—	—	0,144	0,159	0,179	0,204
21	—	—	—	—	—	—	0,151	0,166	0,188	0,214
22	—	—	—	—	—	—	—	—	—	—
23	—	—	—	—	—	—	—	—	—	—
24	—	—	—	—	—	—	—	—	—	—
25	—	—	—	—	—	—	—	—	—	—
26	—	—	—	—	—	—	—	—	—	—
27	—	—	—	—	—	—	—	—	—	—
28	—	—	—	—	—	—	—	—	—	—
29	—	—	—	—	—	—	—	—	—	—
30	—	—	—	—	—	—	—	—	—	—

EK TABLO — Karaçam Gövde Hacim Tablosu
ANHANGTABELLE — Schaftholzmassentafel für Schwarzkiefer

Ağaç boyu Baumhöhe m.	G ö ğ ü s ç a p l a r ı c m. Brusthöhendurchmesser									
	17	18	19	20	21	22	23	24	25	26
M e t r e k ü p (Kbl.) Vorratsfestmeter m. R.										
6	0,080	0,088	0,097	0,105	0,113	0,122	0,132	0,145	0,158	—
7	0,090	0,100	0,110	0,119	0,129	0,140	0,151	0,166	0,181	—
8	0,100	0,112	0,123	0,134	0,145	0,158	0,171	0,188	0,204	—
9	0,111	0,124	0,136	0,149	0,161	0,176	0,191	0,209	0,228	—
10	0,121	0,135	0,149	0,163	0,177	0,194	0,211	0,231	0,251	0,273
11	0,133	0,148	0,162	0,178	0,194	0,212	0,231	0,252	0,274	0,298
12	0,143	0,159	0,176	0,193	0,211	0,231	0,251	0,274	0,298	0,323
13	0,153	0,171	0,189	0,208	0,228	0,249	0,271	0,295	0,321	0,348
14	0,164	0,183	0,200	0,223	0,245	0,268	0,291	0,317	0,344	0,373
15	0,175	0,196	0,217	0,239	0,262	0,287	0,312	0,338	0,368	0,398
16	0,185	0,208	0,230	0,254	0,279	0,305	0,333	0,360	0,391	0,423
17	0,196	0,220	0,244	0,269	0,296	0,324	0,353	0,382	0,415	0,449
18	0,207	0,233	0,258	0,284	0,313	0,343	0,373	0,404	0,439	0,474
19	0,218	0,245	0,272	0,299	0,331	0,362	0,394	0,426	0,462	0,499
20	0,229	0,257	0,286	0,314	0,348	0,381	0,414	0,448	0,486	0,524
21	0,240	0,270	0,300	0,330	0,365	0,400	0,435	0,470	0,510	0,550
22	—	—	—	—	—	0,419	0,456	0,493	0,533	0,575
23	—	—	—	—	—	0,433	0,477	0,515	0,556	0,600
24	—	—	—	—	—	0,457	0,497	0,537	0,580	0,625
25	—	—	—	—	—	—	—	—	—	—
26	—	—	—	—	—	—	—	—	—	—
27	—	—	—	—	—	—	—	—	—	—
28	—	—	—	—	—	—	—	—	—	—
29	—	—	—	—	—	—	—	—	—	—
30	—	—	—	—	—	—	—	—	—	—

EK TABLO — Karaçam Gövde Hacim Tablosu
ANHANGTABELLE — Schaftholzmassentafel für Schwarzkiefer

Ağaç boyu Baumhöhe m.	G ö ğ ü s ç a p l a r ı c m.									
	Brusthöhendurchmesser									
	27	28	29	30	31	32	33	34	35	36
	M e t r e k ü p (Kbl.)									
	Vorratsfestmeter m. R.									
6	—	—	—	—	—	—	—	—	—	—
7	—	—	—	—	—	—	—	—	—	—
8	—	—	—	—	—	—	—	—	—	—
9	0,269	0,293	0,318	0,343	0,368	0,396	0,422	0,448	0,478	0,510
10	0,296	0,321	0,348	0,375	0,402	0,431	0,460	0,489	0,520	0,554
11	0,322	0,349	0,377	0,407	0,436	0,467	0,498	0,529	0,563	0,599
12	0,349	0,378	0,408	0,439	0,470	0,503	0,536	0,570	0,606	0,644
13	0,376	0,406	0,438	0,471	0,504	0,539	0,574	0,609	0,648	0,689
14	0,403	0,434	0,468	0,503	0,538	0,575	0,612	0,649	0,691	0,734
15	0,430	0,463	0,498	0,535	0,573	0,611	0,650	0,690	0,734	0,779
16	0,456	0,491	0,528	0,567	0,607	0,647	0,688	0,730	0,776	0,823
17	0,483	0,519	0,558	0,599	0,641	0,682	0,726	0,771	0,819	0,868
18	0,510	0,548	0,588	0,631	0,675	0,718	0,764	0,810	0,862	0,913
19	0,536	0,576	0,618	0,663	0,708	0,754	0,802	0,851	0,904	0,958
20	0,563	0,605	0,648	0,695	0,741	0,790	0,840	0,892	0,947	1,003
21	0,590	0,634	0,678	0,727	0,775	0,825	0,878	0,933	0,990	1,048
22	0,617	0,662	0,708	0,759	0,809	0,861	0,916	0,973	1,033	1,094
23	0,644	0,690	0,739	0,791	0,843	0,897	0,954	1,014	1,076	1,139
24	0,671	0,719	0,769	0,823	0,880	0,932	0,992	1,055	1,119	1,184
25	—	—	—	—	0,915	0,968	1,030	1,096	1,162	1,229
26	—	—	—	—	0,956	1,004	1,063	1,137	1,205	1,274
27	—	—	—	—	0,985	1,039	1,106	1,178	1,248	1,318
28	—	—	—	—	—	—	—	1,219	1,291	1,363
29	—	—	—	—	—	—	—	1,261	1,334	1,408
30	—	—	—	—	—	—	—	1,303	1,377	1,453

EK TABLO — Karaçam Gövde Hacim Tablosu 251
ANHANGTABELLE — Schaftholzmassentafel für Schwarzkiefer

Ağaç boyu Baumhöhe m.	G ö ğ ü s ç a p l a r ı c m.									
	Brusthöhendurchmesser									
	37	38	39	40	41	42	43	44	45	46
	M e t r e k ü p (Kbl.)									
	Vorratsfestmeter m. R.									
9	0,345	0,378	0,410	0,445	0,482	0,521	0,563	0,607	0,653	0,700
10	0,391	0,427	0,462	0,499	0,539	0,581	0,624	0,671	0,720	0,770
11	0,438	0,476	0,514	0,553	0,596	0,640	0,686	0,736	0,787	0,840
12	0,485	0,525	0,566	0,608	0,653	0,699	0,746	0,796	0,848	0,901
13	0,532	0,573	0,617	0,662	0,709	0,758	0,808	0,860	0,914	0,969
14	0,579	0,622	0,668	0,716	0,766	0,816	0,868	0,922	0,978	1,035
15	0,626	0,671	0,720	0,771	0,823	0,877	0,931	0,988	1,046	1,105
16	0,672	0,720	0,772	0,825	0,880	0,936	0,993	1,052	1,112	1,173
17	0,719	0,769	0,823	0,879	0,936	0,994	1,053	1,114	1,176	1,239
18	0,766	0,818	0,875	0,933	0,992	1,052	1,113	1,176	1,240	1,305
19	0,812	0,867	0,926	0,987	1,048	1,110	1,173	1,238	1,304	1,371
20	0,859	0,916	0,978	1,041	1,105	1,170	1,236	1,304	1,373	1,443
21	0,906	0,965	1,028	1,093	1,160	1,228	1,297	1,368	1,440	1,513
22	0,954	1,015	1,081	1,149	1,219	1,290	1,362	1,436	1,511	1,587
23	1,001	1,064	1,133	1,205	1,279	1,354	1,430	1,508	1,587	1,667
24	1,049	1,115	1,186	1,261	1,338	1,417	1,497	1,578	1,660	1,743
25	1,096	1,165	1,238	1,315	1,394	1,475	1,557	1,640	1,724	1,809
26	1,142	1,214	1,291	1,371	1,453	1,537	1,622	1,708	1,795	1,883
27	1,189	1,264	1,343	1,425	1,509	1,594	1,680	1,768	1,857	1,947
28	1,237	1,315	1,396	1,481	1,567	1,654	1,742	1,831	1,921	2,012
29	1,284	1,365	1,449	1,536	1,624	1,713	1,803	1,894	1,985	2,077
30	1,332	1,415	1,501	1,590	1,680	1,771	1,863	1,956	2,050	2,145
31	—	—	—	—	—	—	2,125	2,225	2,327	2,432
32	—	—	—	—	—	—	2,187	2,289	2,394	2,502
33	—	—	—	—	—	—	2,250	2,354	2,461	2,572

EK TABLO — Karaçam Gövde Hacim Tablosu
ANHANGTABELLE — Schaftholzmassentafel für Schwarzkiefer

Ağaç boyu Baumhöhe	G ö ğ ü s ç a p l a r ı cm.									
	Brusthöhendurchmesser									
m.	47	48	49	50	51	52	53	54	55	56
	M e t r e k ü p (Kbl.) Vorratsfestmeter m. R.									
9	0,952	1,003	1,055	1,113	1,173	1,235	1,302	1,369	1,435	1,505
10	1,024	1,078	1,132	1,192	1,255	1,319	1,389	1,458	1,527	1,600
11	1,096	1,153	1,209	1,271	1,337	1,404	1,476	1,548	1,620	1,696
12	1,166	1,227	1,287	1,351	1,419	1,489	1,563	1,638	1,713	1,791
13	1,241	1,302	1,364	1,430	1,500	1,573	1,650	1,727	1,805	1,886
14	1,313	1,376	1,441	1,510	1,582	1,658	1,737	1,817	1,898	1,981
15	1,385	1,451	1,518	1,589	1,664	1,743	1,824	1,907	1,991	2,077
16	1,457	1,525	1,595	1,669	1,746	1,827	1,912	1,996	2,083	2,172
17	1,528	1,600	1,672	1,748	1,828	1,912	1,999	2,086	2,175	2,267
18	1,601	1,674	1,750	1,828	1,910	1,997	2,086	2,176	2,268	2,363
19	1,673	1,749	1,826	1,907	1,992	2,081	2,173	2,265	2,360	2,458
20	1,745	1,823	1,903	1,987	2,074	2,164	2,260	2,355	2,453	2,553
21	1,817	1,898	1,980	2,066	2,156	2,250	2,347	2,445	2,545	2,649
22	1,889	1,973	2,057	2,145	2,237	2,334	2,434	2,534	2,637	2,744
23	1,961	2,047	2,134	2,225	2,319	2,418	2,521	2,624	2,729	2,839
24	2,033	2,122	2,212	2,304	2,401	2,503	2,608	2,714	2,822	2,935
25	2,105	2,196	2,289	2,384	2,483	2,587	2,695	2,803	2,914	3,030
26	2,177	2,271	2,366	2,463	2,565	2,672	2,782	2,893	3,007	3,125
27	2,249	2,345	2,443	2,543	2,647	2,757	2,869	2,983	3,100	3,221
28	2,321	2,420	2,520	2,622	2,729	2,841	2,956	3,072	3,193	3,316
29	2,393	2,494	2,597	2,702	2,811	2,925	3,043	3,162	3,285	3,411
30	2,465	2,569	2,674	2,781	2,893	3,010	3,130	3,252	3,378	3,507
31	2,537	2,643	2,751	2,861	2,975	3,095	3,217	3,341	3,471	3,602
32	2,609	2,718	2,828	2,940	3,057	3,180	3,304	3,431	3,564	3,697
33	2,681	2,793	2,906	3,019	3,139	3,265	3,391	3,521	3,656	3,793

ANHANGTABELLE — Schaftholzmassentafel für Schwarzkiefer

Ağaç boyu Baumhöhe	G ö ğ ü s ç a p l a r ı cm.									
	Brusthöhendurchmesser									
m.	57	58	59	60	61	62	63	64	65	66
	M e t r e k ü p (Kbl.) Vorratsfestmeter m. R.									
9	1,577	1,650	1,727	1,806	1,887	—	—	—	—	—
10	1,675	1,751	1,831	1,913	1,998	—	—	—	—	—
11	1,773	1,853	1,935	2,020	2,108	—	—	—	—	—
12	1,872	1,955	2,040	2,127	2,217	2,309	2,403	2,500	2,600	2,703
13	1,970	2,056	2,144	2,234	2,326	2,421	2,518	2,618	2,721	2,827
14	2,068	2,158	2,248	2,341	2,435	2,533	2,633	2,736	2,842	2,951
15	2,167	2,260	2,353	2,448	2,545	2,645	2,749	2,854	2,963	3,075
16	2,265	2,361	2,457	2,555	2,654	2,757	2,864	2,972	3,084	3,199
17	2,363	2,462	2,561	2,662	2,763	2,869	2,979	3,090	3,205	3,322
18	2,462	2,564	2,666	2,769	2,873	2,982	3,095	3,209	3,327	3,446
19	2,560	2,665	2,770	2,876	2,982	3,094	3,210	3,327	3,448	3,570
20	2,658	2,766	2,874	2,982	3,091	3,206	3,325	3,446	3,569	3,694
21	2,757	2,868	2,979	3,090	3,201	3,318	3,441	3,565	3,690	3,818
22	2,855	2,969	3,083	3,197	3,311	3,431	3,556	3,683	3,811	3,942
23	2,953	3,070	3,187	3,304	3,421	3,544	3,672	3,801	3,933	4,067
24	3,052	3,171	3,291	3,411	3,532	3,657	3,787	3,920	4,054	4,191
25	3,150	3,272	3,395	3,518	3,642	3,770	3,903	4,038	4,176	4,316
26	3,248	3,373	3,499	3,625	3,752	3,883	4,018	4,156	4,297	4,440
27	3,347	3,475	3,604	3,733	3,862	3,995	4,134	4,275	4,419	4,565
28	3,445	3,576	3,708	3,840	3,972	4,108	4,249	4,393	4,540	4,689
29	3,543	3,677	3,812	3,947	4,082	4,221	4,365	4,511	4,662	4,814
30	3,642	3,779	3,916	4,054	4,192	4,334	4,480	4,630	4,782	4,938
31	3,740	3,880	4,020	4,161	4,303	4,447	4,596	4,748	4,905	5,063
32	3,838	3,982	4,125	4,268	4,412	4,560	4,711	4,866	5,026	5,187
33	3,937	4,083	4,229	4,375	4,522	4,672	4,827	4,985	5,148	5,312
34	4,037	4,185	4,334	4,482	4,633	4,787	4,943	5,103	5,250	5,437
35	4,137	4,287	4,439	4,589	4,744	4,900	5,059	5,221	5,372	5,562

EK TABLO — Karaçam Gövde Hacim Tablosu
ANHANGTABELLE — Schaftholzmassentafel für Schwarzkiefer

Ağaç boyu Baumhöhe m.	G ö ğ ü s ç a p l a r ı c m. Brusthöhendurchmesser									
	67	68	69	70	71	72	73	74	75	76
	M e t r e k ü p (Kbl.) Vorratsfestmeter m. R.									
12	2,810	2,922	3,038	3,157	3,277	3,396	3,515	—	—	—
13	2,936	3,051	3,168	3,290	3,412	3,532	3,652	—	—	—
14	3,063	3,180	3,299	3,423	3,547	3,671	3,792	—	—	—
15	3,190	3,309	3,430	3,555	3,681	3,807	3,933	4,063	4,199	4,342
16	3,316	3,438	3,561	3,687	3,815	3,944	4,074	4,208	4,346	4,491
17	3,443	3,567	3,692	3,820	3,950	4,081	4,215	4,353	4,493	4,640
18	3,570	3,696	3,823	3,953	4,084	4,219	4,357	4,497	4,641	4,790
19	3,697	3,825	3,954	4,085	4,219	4,356	4,498	4,642	4,788	4,939
20	3,823	3,954	4,085	4,217	4,353	4,493	4,639	4,787	4,937	5,088
21	3,950	4,083	4,216	4,350	4,488	4,631	4,780	4,931	5,083	5,237
22	4,077	4,211	4,347	4,483	4,623	4,770	4,921	5,075	5,230	5,386
23	4,203	4,340	4,478	4,616	4,759	4,908	5,062	5,218	5,376	5,536
24	4,330	4,469	4,609	4,749	4,895	5,047	5,204	5,362	5,523	5,686
25	4,457	4,598	4,740	4,882	5,031	5,185	5,345	5,505	5,669	5,835
26	4,584	4,727	4,871	5,015	5,167	5,324	5,486	5,649	5,816	5,985
27	4,711	4,856	5,002	5,148	5,302	5,463	5,628	5,793	5,962	6,135
28	4,838	4,985	5,133	5,281	5,439	5,601	5,768	5,936	6,109	6,285
29	4,965	5,114	5,264	5,414	5,575	5,739	5,908	6,079	6,255	6,435
30	5,093	5,243	5,395	5,547	5,711	5,878	6,048	6,223	6,402	6,585
31	5,220	5,372	5,526	5,679	5,847	6,016	6,188	6,366	6,548	6,735
32	5,347	5,501	5,657	5,812	5,983	6,155	6,328	6,510	6,695	6,885
33	5,475	5,630	5,788	5,945	6,119	6,293	6,468	6,653	6,841	7,035
34	5,603	5,759	5,919	6,078	6,255	6,431	6,608	6,796	6,987	7,185
35	5,731	5,888	6,050	6,211	6,391	6,569	6,748	6,939	7,133	7,335

EK TABLO — Karaçam Gövde Hacim Tablosu
ANHANGTABELLE — Schaftholzmassentafel für Schwarzkiefer

Ağaç boyu Baumhöhe m.	G ö ğ ü s ç a p l a r ı c m. Brusthöhendurchmesser									
	77	78	79	80	81	82	83	84	85	86
	M e t r e k ü p (Kbl.) Vorratsfestmeter m. R.									
11	—	—	—	—	—	—	—	—	—	—
12	—	—	—	—	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—
14	—	—	—	—	—	—	—	—	—	—
15	4,486	4,630	4,775	4,922	5,071	5,225	5,383	5,543	5,705	5,869
16	4,637	4,784	4,932	5,083	5,235	5,392	5,553	5,716	5,882	6,050
17	4,788	4,938	5,090	5,244	5,400	5,559	5,723	5,890	6,060	6,231
18	4,940	5,092	5,246	5,405	5,564	5,727	5,894	6,064	6,238	6,412
19	5,091	5,246	5,405	5,566	5,729	5,894	6,064	6,237	6,415	6,594
20	5,242	5,409	5,562	5,727	5,893	6,062	6,234	6,411	6,592	6,775
21	5,394	5,554	5,720	5,888	6,058	6,230	6,405	6,585	6,770	6,956
22	5,547	5,710	5,878	6,049	6,222	6,397	6,576	6,759	6,946	7,136
23	5,700	5,866	6,036	6,210	6,386	6,565	6,747	6,933	7,123	7,317
24	5,853	6,021	6,194	6,371	6,551	6,733	6,916	7,108	7,300	7,497
25	6,005	6,177	6,352	6,533	6,715	6,901	7,090	7,282	7,477	7,677
26	6,158	6,333	6,510	6,694	6,879	7,069	7,261	7,456	7,654	7,857
27	6,311	6,488	6,669	6,855	7,044	7,237	7,432	7,631	7,832	8,038
28	6,464	6,644	6,827	7,016	7,208	7,401	7,603	7,805	8,009	8,218
29	6,616	6,800	6,986	7,178	7,372	7,572	7,775	7,979	8,186	8,398
30	6,769	6,955	7,145	7,339	7,537	7,740	7,946	8,154	8,364	8,579
31	6,922	7,111	7,303	7,500	7,702	7,908	8,117	8,328	8,541	8,759
32	7,075	7,267	7,461	7,661	7,866	8,077	8,288	8,502	8,718	8,939
33	7,227	7,422	7,620	7,823	8,031	8,246	8,460	8,677	8,895	9,120
34	7,379	7,577	7,778	7,984	8,195	8,414	8,631	8,851	9,072	9,300
35	7,531	7,732	7,935	8,145	8,359	8,582	8,802	9,025	9,249	9,480

EK TABLO — Karaçam Gövde Hacim Tablosu
ANHANGTABELLE — Schaftholzmassentafel für Schwarzkiefer

Ağaç boyu Baumhöhe m.	G ö ğ ü s ç a p l a r ı c m. Brusthöhendurchmesser									
	87	88	89	90	91	92	93	94	95	96
	M e t r e k ü p (Kbl.) Vorratsfest meter m. R.									
11	—	—	—	—	—	—	—	—	—	—
12	—	—	—	—	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—
14	—	—	—	—	—	—	—	—	—	—
15	6,035	6,204	—	—	—	—	—	—	—	—
16	6,219	6,391	—	—	—	—	—	—	—	—
17	6,404	6,579	—	—	—	—	—	—	—	—
18	6,589	6,767	6,947	7,132	7,328	7,524	7,722	7,924	8,126	8,332
19	6,773	6,954	7,137	7,327	7,525	7,725	7,927	8,133	8,339	8,549
20	6,958	7,142	7,328	7,522	7,722	7,926	8,132	8,341	8,552	8,766
21	7,143	7,330	7,520	7,716	7,920	8,127	8,337	8,550	8,765	8,983
22	7,327	7,517	7,711	7,911	8,117	8,328	8,541	8,758	8,978	9,200
23	7,511	7,705	7,902	8,106	8,314	8,529	8,746	8,966	9,191	9,417
24	7,695	7,891	8,094	8,301	8,512	8,730	8,951	9,175	9,404	9,634
25	7,878	8,078	8,285	8,496	8,710	8,931	9,156	9,383	9,617	9,851
26	8,062	8,266	8,476	8,690	8,908	9,133	9,361	9,591	9,829	10,068
27	8,246	8,454	8,668	8,885	9,106	9,334	9,565	9,800	10,042	10,285
28	8,430	8,642	8,859	9,080	9,304	9,535	9,770	10,009	10,255	10,502
29	8,613	8,830	9,050	9,275	9,502	9,736	9,975	10,218	10,468	10,719
30	8,797	9,018	9,242	9,469	9,700	9,937	10,180	10,428	10,681	10,936
31	8,981	9,206	9,433	9,664	9,898	10,138	10,385	10,637	10,894	11,153
32	9,165	9,394	9,624	9,859	10,096	10,339	10,590	10,846	11,107	11,370
33	9,348	9,583	9,816	10,054	10,295	10,540	10,795	11,055	11,320	11,587
34	9,531	9,771	10,007	10,249	10,493	10,741	11,000	11,264	11,532	11,804
35	9,714	9,959	10,198	10,444	10,691	10,942	11,205	11,473	11,746	12,021

EK TABLO — Karaçam Gövde Hacim Tablosu
ANHANGTABELLE — Schaftholzmassentafel für Schwarzkiefer

Ağaç boyu Baumhöhe m.	G ö ğ ü s ç a p l a r ı c m. Brusthöhendurchmesser				100 cm den büyük çaplar için h . f
	97	98	99	100	
	M e t r e k ü p (Kbl.) Vorratsfest meter m. R.				
16	—	—	—	—	—
17	—	—	—	—	—
18	8,542	8,755	8,972	9,192	11,71
19	8,763	8,980	9,200	9,424	12,01
20	8,984	9,205	9,429	9,657	12,30
21	9,205	9,430	9,658	9,890	12,60
22	9,425	9,655	9,886	10,122	12,89
23	9,646	9,880	10,115	10,354	13,19
24	9,867	10,105	10,344	10,587	13,49
25	10,088	10,329	10,572	10,819	13,78
26	10,309	10,554	10,801	11,052	14,08
27	10,530	10,779	11,030	11,285	14,37
28	10,751	11,004	11,258	11,517	14,67
29	10,972	11,228	11,487	11,750	14,97
30	11,193	11,453	11,716	11,983	15,26
31	11,414	11,678	11,944	12,215	15,56
32	11,636	11,903	12,173	12,448	15,86
33	11,858	12,128	12,402	12,681	16,15
34	12,080	12,353	12,631	12,914	16,45
35	12,302	12,578	12,860	13,147	16,75
36	—	—	—	—	—
37	—	—	—	—	—
38	—	—	—	—	—
39	—	—	—	—	—
40	—	—	—	—	—

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