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Different Community Crown Layer Environment Under Purple Ear Arrow Bamboo Shoots of Growth Development Research

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Abstract: The jinfo Mountain National Nature Reserve in3A different type community (deciduous broad-leaved forest,Evergreen deciduous broad-leaved mixed forest,Evergreen broad-leaved forest) under purple ear fargesia (Fargesia decurvata J.L.Lu)Young are of Growth Development Research.Results display:(1)Deciduous broad-leaved forest and evergreen deciduous broad-leaved mixed forest under the purple ear fargesia shooting of early and long duration110 dShooting large shooting rate is high; evergreen broad-leaved forest under the shooting of late and short duration 88 DShooting less shooting rate low; evergreen deciduous broad-leaved mixed forest in the shooting of maximum.(2)Shooting period is divided3A stage: early,Stage and the end the community in purple ear fargesia into each period of time have difference evergreen deciduous broad-leaved mixed forest in the first to enter the shooting stage deciduous broad-leaved forest followed by evergreen broad-leaved forest.Shooting stage is also back are the peak back are rate of size for: evergreen deciduous broad-leaved mixed forest>Deciduous broad-leaved forest>Evergreen broad-leaved forest.(3)The same community crown layer environment under purple ear fargesia Different Period Unearthed of young are ground diameter no significant difference.In deciduous broad-leaved forest and evergreen deciduous broad-leaved mixed forest canopy environment in the Period Unearthed of young are ground diameter between no significant difference but were significantly greater than the evergreen broad-leaved forest ($P<0.05$).(4)Purple ear fargesia young are unearthed after80 dAbout complete high growth process and in lineLogisticEquation was"Slow-Fast-Slow"Of growth trend.High growth rate for: evergreen deciduous broad-leaved mixed forest>Deciduous broad-leaved forest>Evergreen broad-leaved forest and difference significant ($P<0.05$).(5)Purple ear understory of bamboo cloning reproduction and ramet density between have close relationship.With the ramets density of increase shooting quantity increase bamboo quantity reduce.This study show that different Community crown layer environment under purple ear bamboo growth development significant difference in evergreen deciduous broad-leaved mixed forest in development best evergreen broad-leaved forest in development worst, population density of bamboo of update development the important regulation role.

Keywords: Purple ear fargesia; Community type; Canopy environment; Shooting Law

Cloning Reproduction(Clone Propagation)Also said asexual reproduction or nutrition Reproduction(Vegetative Propagation)Is refers to clones plant in base of the formation of tubers,Bulb,Viviparum,Portuguese runners and underground rhizome and in addition to seed outside of reproductive component (Propa-gative Module)The new of the ramets of the clones expand Clones

Its Breeding update main is by nutrition body meristem shooting to bamboo to implementation so shoot bud of

germination and bamboo shoots of survival rate of bamboo forest of update[34]

And supplement is very important.Are of is production management and management the most key of period about different bamboo species shooting law of study domestic has[56]

Have many reports.Different bamboo species shooting time and temperature,Humidity,Water,Soil closely related must reach a certain of conditions bamboo shoots only start growth so different bamboo species of shooting time[7/8](In Difference.According to the dendrocalamus hamiltonii Nees et Arn.Dendrocalamus hamiltonii Nees et Arn.Ex Munro),Phyllostachys glauca(Phyl,-lostachys glauca McClure),Bamboo(Phyllostachys heterocycla(Carr.)Mitford)The study shows that shooting

By temperature,Precipitation and factor influence; back are reason main for nutrient lack and plant diseases and insect pests; bamboo of morphology characteristics (Ground Diameter,Plant height)[1213]

Is its clones population update of Quality Index.Has been study show that bamboo shoots of high growth law were was"Slow-Fast-Slow"Of growth trend and each species of growth law and growth difference is

Growth also have influence canopy density big of forest and forest window edge growth of fargesia (Fargesia spathacea Franch)Shooting the number of and back are the number of greater than forest window center reason may is suitable of light promote the bamboo shoots of rapid growth lead to shooting of is big, at the same time canopy density is big of place also may is Giant Panda like feeding of environment on bamboo shoots the feeding to fargesia update and feeding after leave residue pile back are[19]Number of more.At present on Canopy environment on bamboo growth development of research also is less.

Subalpine path bamboo is wild giant panda of main food is influence the population survival reproduction of external factors one and for the[12Natural 2021] To provide the most to adapt to the habitat environment .Path bamboo 698 Graft materials with of report The first36Volume

The update and its life cycle and the survival of the giant panda and protection close phase Section of their nutrition components of change the giant panda of foraging is particularly important because bamboo shoots contain of nutrition components is high and cellulose content low,

This on small diameter Bamboo Shoots Growth Development Law the research can protection giant panda provide certain of theory basis.Purple ear fargesia (Fargesia decurvata J.L.Lu)For complex axis style mixed bamboo to guerrilla style[23]

Or-intensive of style the reproductive extended distribution in, Shaanxi southwest,Hubei Western,, Hunan northwest and Sichuan Eastern Main Growth in altitude1150~1610 mOf slope to is Giant Panda main[2124]

To feeding bamboo species one.At present, the purple ear arrow bamboo shoots of growth law of study also no reports.We by the purple ear fargesia shooting,Back bamboo shoots and bamboo law the research investigate the different Community crown layer environment under purple ear fargesia shooting law of difference light environment on the Growth of influence, in order to for purple ear understory of bamboo management and management provide theory basis.

1. Material and Methods

1.1 Study Area natural Overview

Jinfo Mountain National Nature Reserve (28 ° 46'~29 ° 38 'N106 ° 54'~107 ° 27 'E)Is located in Chongqing Nanchuan district belongs to subtropical moist monsoon climate cloud more sunshine less rainfall abundant humidity big.Mountain main by limestone and of limestone belongs to typical of karst Landform.Mountain upper average annual temperature8.5Average annual precipitation about1434.5mm;Mountain lower average temperature16.6Average annual precipitation about1286.5mm.Altitude1400~2252 mElevation difference big vegetation type rich.Jinfo Mountain is located in China's3Big plant natural distribution center one"Western Hubei-East Sichuan plant distribution center"Is not only our country something plant distribution of junction zone north-south plant boundary of Edge Area.Area plant style many have records or investigation in has found the plant

up294Of1588Of5600More than a of Wild seed plant160Of1111Of4093Of.In the study area in main forest type for mountain broad-leaved forest (deciduous broad-leaved forest,Evergreen deciduous broad-leaved mixed forest,Evergreen broad-leaved forest).Evergreen tree species main have:Rough pulse Rhododendron(Rhododendron coelo-neurum Diels),Jinshan Rhododendron(Rhododendron longi-PES Rehd.Et Wils.VaR.Chienianum(Fang)Chamb.Ex Cullen et Chamb.),Machilus(Machilus pingii Cheng ex Yang),Winter, green(Ilex chinensis SIMS),Mountain alum(Symplocos sumuntia Buch.-Ham.

Ex D.Don)And puta Ko (Fagaceae)Plants;Deciduous tree species, the main, to have:Ray, goose, ear, stable(Carpinus viminea Wall.),Brown birch (Betula utilis d.Don),Liriodendron(Sorbus folgneri(Schneid.)Rehd.),Green squeezed maple (Davidii Franch.).The forest is widely distributed in (Chimonobambusa utilis(Keng)Keng f.), Ping Zhu (Qiongzuea communis Hsueh)Bamboo with purple fungus It is an important plant resource and an important economic source for local residents..

1.2 Research methods

The study area is located in the Nanba Jing (29 ° 01'n,107 ° 09'e).2016Year11Month, the choice of site conditions are basically the same, no one for interference3.Typical plant community types: deciduous broad-leaved forest,Evergreen and deciduous broad-leaved mixed forest (hereinafter referred to as the mixed forest) and evergreen broad-leaved forest as the research plots.Each forest size is not less1 $hm^{2\cdot}$, Interval not less50 m.Each forest type is set separately3.Area is300 $m^{2\cdot}$Big sample.In the same forest type3.A large quadrat, in the main species composition,Canopy density and altitude are consistent as possible.Basic information of sample plots1..

UseHemiviewDigital Plant Canopy analysis system (EOS 50dCamera,Sigma ex DCFish Eye Lens)3.Canopy opening and under-Forest illumination environment of forest types (Direct Light,Scattered Light,Total illumination)Data Measurement.After statistical analysis,3.There were significant differences between canopy opening and under-Forest illumination environment of different forest types.

P<0.05)They are:Deciduous broad-leaved forest>Evergreen and deciduous broad-leaved mixed forest>Evergreen broad-leaved forest.

In each large sample of each forest type, the random set

2. M x 2 mLittle sample9.The number of branches of all the small sample of the Bamboo Shoots,Average height,Coverage and other indicators were measured, and then in the bamboo shoot season (3.~7.Month), For all2 m x 2 mDynamic Tracking Observation of fixed sample with Small Sample.From2017Year3.Month begins, every other5.~10 dObservation1.Record the number of young bamboo shoots in Small Sample,Bamboo Shoots count,Height of Bamboo Shoots,Number of young bamboo shoots unearthed,Listing, record the time of bamboo shoots and the time of returning bamboo shoots (the characteristics of returning bamboo shoots are: slow growth until stop; the appearance of bamboo shoots gradually becomes deep and dull; the bamboo shoots are loose until the hair is withered;

Morning bamboo shoots without Dew).

In each large sample, select the young bamboo shoots that occurred during the same period15Strain, every other5.~10 dObservation1.High growth and radial growth of young bamboo shoots were recorded until all young bamboo shoots developed into bamboo shoots..

Note:DBF, Deciduous broad-leaved forest;MBF, Mixed evergreen and deciduous broad-leaved forest;EBF, Evergreen broad-leaved forest;Se, Southeast;SW, Southwest.The same below.

Notes:DBF,Deciduous broad-leaved forest;MBF,Evergreen-deciduous broad-led mixed forest;EBF,Evergreen Broad-led Forest;Se,Southeast;SW,Southwest.Same below.

1.3 Data Statistics

Bamboo Shoot Yield=Bamboo Shoots/Total number of ramets$X$ 100%;Proportion of Bamboo Shoots=Bamboo Shoots count/Total bamboo shoots$X$ 100%;Retirement rate=Bamboo Shoots count/Bamboo Shoots$X$ 100%;Cheng bamboo Rate=(Bamboo Shoots-Bamboo Shoots)/Bamboo Shoots$X$ 100%;Relative growth rate=(The

height of young bamboo shoots in a certain period-Initial shoot height)/Growth timeX 100%.AdoptedOne-way ANOVAOkay.3.Purple ear in canopy environment of different species

Bamboo Shoot Yield,Retirement rate,The differences between height growth and ground diameter growth were analyzed.LSDMultiple comparisons (Alpha= 0.05).Density of ramets and number of Bamboo Shoots,Correlation regression analysis of bamboo yield (AlphaRespectively

0.01And0.05).TheExcel 2010AndSPSS 22.0Into

Line Data AnalysisOrigin 9.0Software Mapping.

2. Results and Analysis

2.1 Different community crown layer environment under purple ear bamboo shooting and back are compare the different Community crown layer environment under purple ear fargesia young are unearthed time don't?

With but were from3Month start shooting.From figure1:ACan see evergreen broad-leaved forest (EBF)Under the purple ear fargesia shooting time the most late stop shooting time first shooting Number of at least duration88 d;Deciduous broad-leaved forest (DBF)And mixed forest (MBF)Under the shooting time and stop shooting time similar duration110 dAnd mixed forest under the shooting of the highest.Different community crown layer environment in purple ear fargesia shooting the first1Times peak were there in4Month Mid-the first2Times peak appear in5Month Mid-fluctuation is big.Mixed Forest in purple ear fargesia shooting rate significantly greater than other two of forest types ($P<0.01$)Deciduous broad-leaved forest and evergreen broad-leaved forest in the shooting rate no significant difference($P>0.05$)(Figure1:B).

According to different period shooting of percentage can will shooting

Period is divided3A stage:Early,Stage and the end.The forest types under purple ear fargesia into each period of time have difference.Statistical results display (Table2)Shooting main concentration in stage back are also main concentration in Stage.Mixed Forest in shooting the number of most but are rate highest; and evergreen broad-leaved forest in Shooting Number of at least back are rate minimum.With the shooting time of delay back are rate was increased the trend bamboo rate was reduce of trend.Deciduous broad-leaved forest and mixed forest in early in the young are bamboo rate end of young are bamboo rate low but evergreen broad-leaved forest show instead of trend.In addition back are of height with the time of over overall decreased of trend back are height: Mixed Forest>Deciduous broad-leaved forest>Evergreen broad-leaved forest.

2.2 Different community crown layer environment under purple ear fargesia young are ground diameter growth law

Statistical results show that the same community crown layer environment under purple ear arrow

Bamboo Different Period Unearthed of young are ground diameter difference don't significantly ($P>0.05$)(Table3).In deciduous broad-leaved forest and mixed forest in early unearthed young are than late unearthed young are of ground diameter big and in evergreen broad-leaved forest in is late

Soil young are than early unearthed young are of ground diameter big.Different community crown layer environment under deciduous broad-leaved forest and mixed forest unearthed young are of ground diameter had no significant

Difference ($P>0.05$)But were significantly greater than the evergreen broad-leaved forest under unearthed young are of ground diameter ($P<0.05$).

Different community crown layer environment under purple ear fargesia young are-Young Bamboo height growth law Select the forest types stage with time unearthed of young are as an view Observation object.Purple ear fargesia young are unearthed after80 dAbout complete high growth process (Figure2).Young are high growth fastest of period is the firstNatural 20 d

To the first60 dBetween especially is the firstNatural 20 dTo the first40 dPerformance most obvious (Figure2:B).Which mixed forest (MBF)Young are high 700 Graft materials with of report The first36Volume) * Forest

type DBFDeciduous broad-leaved forest;MBFEvergreen deciduous broad-leaved mixed forest;EBFEvergreen broad-leaved forest.Different lowercase letters said difference significant (P<0.05).The same below. DBFDeciduous broad-leaved forest;MBFEvergreen-deciduous broad-leaved mixed forest;EBFEvergreen Broad-leaved forest.Different small letters mean significant difference at 0.05.Same below.

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The average growth rate is0.91/d;Deciduous broad-leaved forest (DBF)Second, the average growth is0.58/d;Evergreen broad-leaved forest (EBF)Slowest, average growth0.33/dThe relative growth rate of young bamboo shoots was significantly different among different forest types.

P<0.01)(Figure2.:A).Young Bamboo Shoots-Growth time and height of Young BambooLogisticEquation fitting and Young Bamboo Shoots of different forest types-Growth Curve Model and fitting coefficient ($R^{2.}$)For:

The test shows that young bamboo shoots-There was a significant correlation between growth time and height of Young Bamboo (P<0.001).Middle and Young Bamboo Shoots of various forest types-

High growth of young bamboo"S"Shape Curve,"Slow-Quai-Slow"The growth trend.

2.4 The relationship between Clonal Propagation and branch density of Phyllostachys edulis

With the variation of the density of different forest types, the number of bamboo shoots and the rate of bamboo shoots also changed (Figure3.).There was a very significant positive correlation between the density of ramets and the number of bamboo shoots.(P<0.001)The higher the density of bamboo branches, the more bamboo shoots (Figure3.:A).However, there was a significant negative correlation between the density and the rate of bamboo (P: 0.0014)With the increase of branch density, the rate of bamboo formation decreased significantly, and the rate of bamboo formation slowed down after reaching a certain level (Figure3.:B).

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Shooting of short,Shooting less,Shooting rate low.Show that canopy depression closed cause of low light environment is not conducive to the young are shooting.Canopy Trees canopy density the higher the lower light strength and light time the less mother bamboo can full use of solar energy the less photosynthetic capacity of the more low Temperature changeable rainy season obvious to lead to shooting of fluctuation is big this [31]

And xu wen and of research results similar.Different community canopy environment under purple ear fargesia shooting quantity,Back are rate and bamboo Rate3Between the performance for shooting quantity the more,Back are rate the higher,Bamboo rate the low of phenomenon; but the canopy environment under showed the following characteristics the: shooting stage of are body is big,Nutrient adequacy,Robust development,Bamboo Shoot formation rate and high bamboo shoot retirement rate,Undernutrition,Sheng [30],

The photosynthetic capacity of bamboo shoots is related, but the growth of bamboo shoots is not the fastest in the deciduous broad-leaved forest with the best light conditions, but the fastest in the mixed forest, which is related to the temperature of the forest.,Moisture,Humidity,Nutrient and other factors [27,37]

Related to the comprehensive role .

In conclusion, there are significant differences in the growth and development of different species of Phyllostachys edulis in different canopy environments, which has a great relationship with the light conditions in the forest..The low light environment is not conducive to bamboo shoot growth, and it also inhibits the high growth and radial growth of bamboo shoots..Climate and Nutrient Conditions of different forest canopy environments are also important factors affecting the growth and development of bamboo population.In addition, bamboo population density has a regulatory effect on its clonal reproduction..

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