ROOTSTOCK QUALITY INFLUENCE VINEYARD VITALITY IS AND ON YIELD

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Present Research Aim Aim Rootstock Material Qualitative Settings Critical Influence Analysis Vitis vinifera - Long-term Productivity And Agroecological With stress factors Adaptation . Rootstock Genetic , physiological And Agronomic Features Causes Vine Roots System efficiency , which It is crucial. Harvest Quantity And On the quality of Georgia , as Viticulture Region In context , let's study Imereti And West Georgia Nursery Principles of farm operations.

Conducted By analysis We revealed Nursery Technology Disorders , in particular , grafting Process Inappropriate Performance And Phytosanitary Hygiene Disadvantages . This Factors significantly Growth Asymmetrical Callus Formation And Pathogenic Mushrooms Latent Infection The risk that Finally Vine Degradation And Economic Efficiency reduction Causes . Research To the line Asks See also Phylloxera vastatrix - it Spread Prevention Necessity .

Work Final Part Includes Recommendations Certification Standards implantation , grafting Procedures Tightening And Resistant Rootstocks Mandatory Use About , as Strategic Events Georgia Viticulture Competitiveness For reinforcement .

Keywords: vine rootstock ; viability ; grafting Quality; Phylloxera .

Vineyard Production In context , the root Material Quality represents Fundamental The factor that Causes Vine Long-term productivity , resistance to phytopathogens Resistance And Agroecological With conditions Effective Adaptation . The rootstock , in fact , represents Biological The substrate on which Depends Total Vineyard Viability And His/Her Ecosystem Sustainability .

Rootstock Genetic , physiological And Agronomic Features directly Correlated As Grapes Yield with volume , as well as His Qualitatively parameters (e.g. sugar content , acidity) . This Options Final In total Determines Wine Production Process Economic Efficiency And Technological Optimization .

Climate Change , soil Degradation And Diseases Intensive Spread Modern Challenges In the background , critical importance Acquires Such Rootstocks Selection And development , which They stand out. Drought-resistant , resistant to pathogens High With perseverance And Miscellaneous Abiotic With stress factors Adaptation With the ability to . The world Anchor Viticulture In the regions In progress Intensive Hybridization And Genetic Selection Research

New Rootstocks To create , which Optimally They fit. specific Agro - climatic Conditions And They provide Vineyard Operation Long-lasting Period .

Georgia , as Vine Genetic Resources Grapevine (Vitis vinifera) , has Unique Genetic Diversity And Viticulture Rich , centuries-old Traditions . This In a context where Viticulture Historically Strategic Agricultural The field represents And Vine Country Cultural Identity Indivisible It is an element , quality. Rootstock - material Production National - economic importance However , local Nursery Sector Regularly Encountering Essentially challenges , they Among : certified , virus-free Free Rootstocks Limited Accessibility , efficiency Phytosanitary With control Connected Problems And International Quality With standards Harmonization necessity . This Problems To overcome It is necessary Modern Biotechnological Methods Implementation , scientific research Institutions Engagement And Anchor International Experience Sharing , which Hand Will help High Quality Nursery Material Production Stimulation And Sustainability .

Rootstocks Quality Ascension Tight In connection As Agroecological Conditions with optimization , as well Rural Farming Economic Efficiency With growth , which The topic Special Scientific And Practical Relevance Grants .

Present Research Within , one of Critical Violation We have identified the grafting Technological Rules Ignoring what directly Correlated Vineyard Long-term Vitality With the decline . The rootstock Material Production In process Existing Defects From the meaning Based on the research Empirical Part We dedicated it to Imereti And West Georgia specific On locations Existing Nursery Farms Work Methodology And Seedlings Quality Analysis .

Research The most important The goal is Vine Rootstock Quality Critical Of importance Demonstration Vineyard Development All At the stage . Goal Includes : Global And Local Trends Systemic Analysis , local Nursery In the sector Existing Technological And Phytosanitary Problems Identification And Scientifically Reasonable Recommendations development . mentioned Recommendations Hand Will help Georgia Viticulture Competitiveness To rise International On the market .

Rootstock represents Vitis Surname Plant That Vegetative The part on which is being carried out Desired Cultivated By grafting the variety (Vitis vinifera) Multiplication . Its Function No Limited Only Mechanical with a support ; it Essentially influence Does Vine Physiological On homeostasis , with the soil Interaction Mechanisms And completely Vineyard Ecological On vitality . High Quality Rootstock Provides Roots System Optimal development , water And Food Substances Effective Absorption and Uptake , which directly It is reflected Harvest Quantitative Indicators And His Qualitatively On the characteristics .

Initial Stage Nursery Material Viability Provision For the purpose of healthy Rootstock I must to satisfy Then Basically Morphological And Physiological Criteria :

- Fabric Integrity And Vitality ;
- Dehydration Absence : Rootstock I must To maintain Adequate Humidity And No I must to have Dried (necrotic) cells , which indicates His Physiological On activity ;
- Visual Integrity : No I must To be noticed Mechanical Damage Or Defects Neither Varji On the zone And Neither Bark on the surface , because Such Injuries Pathogens Invasion Potential It's a hearth .
- Productivity Potential : High Energy And Normal Development : Plant I must To be characterized Normalized Growth At a pace And to ensure Grafted For the breed Characteristic Yield Potential Realization .
- Conducted Observation And Monitoring Based on this , we have determined that Rootstocks Complex Quality Evaluation Critically It is important. Vineyard Long-term Vitality , optimal Yield And To phytopathogens Resistance To ensure quality Rootstocks They will cause No Only Mechanical stability , but also Vine Physiological And Genetic Homeostasis .

Physiological Options :

1. **Roots System Morphology :** Dense And Strong Roots System existence , which Provides From the soil Water And Mineral Food Substances Optimal Transportation And To master .

✓ **Vegetative Development :** Energetic Sprouts Development And Viable Buds Formation , which Critically It is important. Planting Further Fast And Stable Vegetation For the process

2. **Genetic Stability**

✓ **Selective Integrity :** The foundations , which Accepted Purposeful Selection As a result , we are obliged Are to maintain Mother For the plant Characteristic (programmed) desired Attributes . This Provides Grafted Breed Harvest Qualitative Features Genetic Stability .

✓ To phytopathogens Resistance : High Natural Sustainability For the vine Important Diseases (e.g. , viruses , bacteria) and Against pests (e.g. , nematodes , mites) .

Our research process confirmed that the necessary Physiological Stability To preserve , graft Seedling Planting Process I must To correspond Strict Technological The rules . In particular, the rules of grafting Place (callus) Zone) Soil From the surface Not less than 5 cm At altitude I must to remain . this Procedure It is necessary In order to At first To be Avoided Callus Contact With soil And , therefore , Adventist Roots Generate (Vitis vinifera) on the stem), Which Winegrowers " on the bitter side " " work is called " Adventist Roots Growth significantly Inhibits (Vitis vinifera) Basic Roots System Development of vegetation During the period Soil Rinse off Or Agrotechnical Works As a result Callus Zone Coverage In case ,

it is necessary Generated Roots Be careful. Removal (pruning) And Callus Area Land Up Maintenance .

Rootstock Optimal Choose Most important is a factor that Determines Vine Adaptive Potential Miscellaneous Soil And Climatic With conditions .

Table 1. Rootstocks Adaptation Soil And Climatic With stress factors

Adaptation Type	Agroecological Condition	Features / Function	Example (root)
Soil	**Lime High Content**	High **To lime Resistance** (to chlorosis) Prevention).	41B, 420A
	Salty Soils (saline)	Tolerance In the soil **Salt High Concentration** Towards .	Ramsey, 1103 Paulsen
	Dry And Poor Soils	Deep , extensive Roots System Water Effective For extraction .	110R, 140Ru
Climatic	**Drought (xerophilous) Conditions)**	Strong And Deep Roots System Hydrophysical For stability .	110R, 140Ru, 1103P
	Cold Climate	Early Awakening And **Winter To the cold Persistence** .	SO4, 5BB
	Hot Climate	High Temperature-sensitive Tolerance And **Transpiration Control** Mechanisms .	140Ru, 1103P

Phytosanitary Adaptation (pests)

- Phylloxera (Phylloxera vastatrix) resistance : All Modern Commercial The rootstock , which Used For grafting , you must to be To phylloxera resistant , which represents Field Fundamental Request .
- Ticks And To nematodes Durability : Some Selective Rootstock Also Owns Additionally Immunity Such Important Pests towards , such as Nematodes And Ticks (e.g. , Freedom, Harmony).

The foundation And Between the graft (Vitis vinifera) Physiological Compatibility Provision Critical . High Compatibility Causes Callus Zone Fast And perfect Healing , which It is necessary Food Substances Optimal Translocation And Quality Harvest For formation .

Callus perfect Healing represents Successful Vegetative Development Decisive factor . improperly Healed Seedling Growth Woven Diseases The risk that directly causes Vine Vitality Degradation And Irreversibly Results .

Grafting Equipment Accurate Protection Reduces Pathogenic Infections Risk And Provides Seedling Fast growth . This In process It is essential. Special Technological And Hygienic Norms Strict Protection .

Critical The parameter is : Foundation And Vitis vinifera - Wounds Geometric Equality . Wounds Size Disagreement causes Asymmetrical Callus formation , which significantly Growth Miscellaneous Phytopathogen Invasion Risk And Maybe To become Seedling Inferior Anomaly Development Home Reason .

The foundation And Grafted Ideal Compatibility , identical Wounds And Callus perfect Healing Under the conditions , the seedling Stands out High With vitality And Maximum Development with the potential that Provides Vineyard Stable productivity . On the contrary , the nursery On the farm Hygienic Norms Vulnerability Or Grafting Inaccurate Performance causes Seedling Development Chronic problems that Latently It appears As Initial , as well Yield During the period .

Phylloxera (Phylloxera vastatrix) is Vine One by one Most Destructive The pest . Its Spread Basic Source Infected , uncertified Nursery The material , especially That In case if Seedling Grafted No is Resistant On the foundation Or No is being carried out Strict Phytosanitary Control .

If In the nursery Used Phylloxera Towards Non-resistant Rootstocks Or Ungrafted Vitis vinifera , exists High The risk that Pest Eggs Or Larvae Already Common to be Roots on the system . This Forms Visual By viewing Hardly It is noticeable that Diagnostics And Control It makes it difficult .

Such Infected Seedling New On the plot Sale And Move Hand It helps Pest Active Multiplication New in the soil , which Gradually causes Whole Vineyard Infection (infestation) And His/Her Vitality Sharp decline . Phylloxera Spread See also Possible Soil With particles together (land) With a belt Or (container) transportation by the way , if Nursery In the soil Pest Already There was .

Phylloxera (Phylloxera vastatrix) infestation Problem Permanent Overcoming Home And Strategic Solution is Resistant American On the foundations Grafting . The above Approach , mandatory Nursery Phytosanitary With control Together , critically It is important because Chemical By means Pest Complete Elimination practically It is impossible . Currently , commercial In nurseries Vitis vinifera - Multiplication Most Reliable Road Exactly American Origin Rootstocks is to use , which Phylloxera Nursery With material Spread Excludes .

Grafting Violation As a result Caused Fungal Pathologies Nursery Under conditions when Grafting Operation is being carried out Technological Rules And Sterile Hygienic Norms With violation , callus Zone Healing The process (cologenesis) is incomplete . This significantly Growth Woven Infection Risk .

Incorrectly Healed Callus In the area It happens Fungal Pathogens (e.g. , Fusarium, Phaeomoniella spp.) Colonization , which They invite Seedling Progressively The decline . The above Pathology Results It appears Grafting On the spot Hills Or Cancer Similar Necrotic Injuries In the form of .

It is noteworthy that Infection Maybe to be Latent – seedling In appearance Healthy Developing And gives Satisfactory harvest . However , callus Zone Transverse When cutting It appears Fungal By invasion Caused Problem : Infection Of time During It damages Xylem And Phloem Capillary A system in which In progress Water And Food Substances Ascendant Transport . This Yes Finally causes Vine Degradation .

Fungal Infection Process Maybe Years During To be ongoing Asymptomatically (latently) , what Even when Vineyard In appearance Maintains Healthy Appearance . However , over time Certain Period Then Maybe To note Seedling Damage One-sided Reveal Or Mass Degradation . This Symptoms Detection Dynamics directly Depends Pathogen Spread Speed And Woven In structures His Invasive on moving , which Determines Infection Final influence Seedling Health .

Critically It is important. From the nursery Only Certified , visual And Tissue (callus) (zone) inspection Sane Seedlings Selection .

High Quality Nursery Material To ensure And Phytosanitary Risks To minimize Recommended Next Preventive Events :

- Seedlings Certification : Mandatory There is a request. From viruses Virus- Free And Certified Nursery Material Use .
- Grafting Technology : Sterile Hygienic Norms And Standard Grafting Procedures Strict Protection Callus Zone perfect Healing For the purpose .
- Soil Monitoring : Soil Regular Phytosanitary Monitoring Phylloxera vastatrix - Isa And Other Quarantine In terms of pests (nematodes) .
- Callus Zone Control : Seedlings Vegetation In process Callus Regular Check Adventist Roots Generates Prevention For the purpose .

Conclusion :

Research confirms that Healthy Rootstocks Selection And Grafting In process Technological Discipline Provision Decisive It is a factor. Vineyard Vitality , productivity And Economic Sustainability To achieve . local In nurseries Inappropriate Technology Use Growth Fungal Infections And Phylloxera Spread risk , while Callus Wrong Development causes Seedling

Degradation And Premature Decline . Effective Nursery Technologies And Controlled Phytosanitary Procedures Implementation Provides High Quality , pathogens Sustainable Seedlings acceptance , which It is necessary Georgia Viticulture Long-term Development And Global For competitiveness .

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