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ENOLOGIA

AMERICAN JOURNAL OF ENOLOGY AND VITICULTURE

Influência das estirpes de *Saccharomyces cerevisiae* e *Oenococcus oeni* no sucesso da fermentação maloláctica no vinho

Palavras chave : *Saccharomyces*, *Oenococcus*, interação, fermentação maloláctica

Abstract

Previous studies have shown the importance of ethanol and sulphur dioxide production by *Saccharomyces cerevisiae* on the growth of *Oenococcus oeni*. Our goal was to examine other interactions between these organisms, including competition for nutrients and production of microbial inhibitors, and their relative importance in winemaking. Fourteen strains of *S. cerevisiae* commonly used in vinification and 16 strains of *O. oeni* were studied. To better replicate conditions of winemaking in the laboratory, natural grape juices were fermented with the different yeasts, followed by inoculation of the bacterial strains into the wines. Bacterial growth and malate depletion were monitored in the wines. Results from these fermentations were compared to industry trials and to interactions observed on agar plates. The relationship between growth and malolactic activity in *O. oeni* is important to the discovery of a simple method for identification of positive and negative interactions between yeast and bacteria. Many strains performed malolactic fermentation without growing in the wine. Most plating methods rely on growth of the bacteria and will not be successful predictors of compatible pairs when the bacteria do not require growth for malolactic activity. The plating method described here is useful for differentiating between effects of yeast on *O. oeni* due to nutrient competition and effects due to production of inhibitory compounds. Eighty-eight percent of the wines showing negative growth effects on plates also resulted in unsuccessful malolactic fermentation in the laboratory-scale wines.

Arnink, K., Henick-Kling T. (2005) Influence of *Saccharomyces cerevisiae* and *Oenococcus oeni* Strains on Successful Malolactic Conversion in Wine. *American Journal of Enology and Viticulture* **56**, 228-237.

Modelação da fermentação alcoólica nas condições enológicas: praticabilidade e interesse

Palavras chave : *modelo matemático, validação, fermentação, vinho*

Abstract

In wineries, the fermentation process could be improved and better controlled by using technologies such as lower energy consumption and efficient tank management. Thus, we designed a mathematical model of fermentation based on physiological considerations, including the effects of assimilable nitrogen and temperature. The ability of this model to simulate the kinetics of many experiments performed in winemaking conditions was tested. The model was first validated on synthetic media with various nitrogen concentrations and at various temperatures. Simulations were then run for fermentations performed on grape musts. Most fermentation kinetics and durations were predicted accurately (with the exception of "atypical" musts leading to sluggish fermentations). The model predicted accurately the fermentation kinetics of >80% of experiments performed with 20 wine yeast strains. The superimposition of fermentation kinetics of experiments performed on laboratory, pilot, and industrial scales showed that it is possible to use the model for winemaking fermentations in tanks.

Colombié, S., Malherbe, S., Sablayrolles, J.M. (2005) Modeling Alcoholic Fermentation in Enological Conditions: Feasibility and Interest. *American Journal of Enology and Viticulture* **56**, 238-245.

Remoção de componentes proteicos específicos pela quitina favorecendo a estabilidade proteica num vinho branco

Palavras-chave : *proteínas do vinho, estabilidade do vinho, quitina, chitinase*

Abstract

The effect of chitin [poly(*N*-acetyl-1,4-β-D-glucopyranosamine)], an abundant, low-cost natural polymer, on white wine stabilization on a laboratory scale was studied in comparison with bentonite fining. Treatments of an unfined wine with increasing doses of chitin allowed a reduction of up to 80% of the haze induced by the heat test, which corresponded to a reduction in wine protein content of less than 29%. In contrast, bentonite fining, although allowing a complete stabilization, resulted in the removal of almost all the proteins from wine. These results suggest that chitin can remove from wine protein components involved in haze formation more specifically than bentonite. SDS-PAGE analysis of both the proteins remaining in wine and those adsorbed by chitin confirmed this specificity. Chitinolytic activity detection after SDS-PAGE separation demonstrated that a main protein component removed by chitin corresponded to the class IV chitinase of grape origin involved in white wine instability. Because class IV chitinases are characterized by bearing a chitin-binding domain, a specific interaction of these wine proteins with chitin can be suggested. Preliminary trials with chitin immobilized in a column system indicated the possibility to regenerate this matrix and to use it continuously for white wine stabilization. However, the effects on both the organoleptic quality and the long-term stability of white wines treated with chitin need to be determined in the actual winemaking conditions.

Vincenzi, S., Polesani, M., Curioni, A. (2005) Removal of Specific Protein Components by Chitin Enhances Protein Stability in a White Wine. *American Journal of Enology and Viticulture* **56**, 246-254.

AUSTRALIAN JOURNAL OF GRAPE AND WINE RESEARCH

Implicações da nutrição com azoto para as uvas, para a fermentação e para o vinho

Palavras-chave : *azoto, fertilização, uva, mosto, vinho, Vitis vinifera, leveduras, Saccharomyces cerevisiae, fermentação, sabor*

Abstract

This review discusses the impacts of nitrogen addition in the vineyard and winery, and establishes the effects that nitrogen has on grape berry and wine composition and the sensory attributes of wine. Nitrogen is the most abundant soil-derived macronutrient in a grapevine, and plays a major role in many of the biological functions and processes of both grapevine and fermentative micro-organisms. Manipulation of grapevine nitrogen nutrition has the potential to influence quality components in the grape and, ultimately, the wine. In addition, fermentation kinetics and formation of flavour-active metabolites are also affected by the nitrogen status of the must, which can be further manipulated by addition of nitrogen in the winery. The only consistent effect of nitrogen application in the vineyard on grape berry quality components is an increase in the concentration of the major nitrogenous compounds, such as total nitrogen, total amino acids, arginine, proline and ammonium, and consequently yeast-assimilable nitrogen (YAN). Both the form and amount of YAN have significant implications for wine quality. Low must YAN leads to low yeast populations and poor

fermentation vigour, increased risk of sluggish/stuck/slow fermentation's, increased production of undesirable thiols (e.g. hydrogen sulfide) and higher alcohol's, and low production of esters and long chain volatile fatty acids. High must YAN leads to increased biomass and higher maximum heat output due to greater fermentation vigour, and increased formation of ethyl acetate, acetic acid and volatile acidity. Increased concentrations of haze-causing proteins, urea and ethyl carbamate and biogenic amines are also associated with high YAN musts. The risk of microbial instability, potential taint from Botryt/s-infected fruit and possibly atypical ageing character is also increased. Intermediate must YAN favours the best balance between desirable and undesirable chemical and sensory wine attributes. 'Macro tuning', of berry nitrogen status can be achieved in the vineyard, given genetic constraints, but the final 'micro tuning' can be more readily achieved in the winery by the use of nitrogen supplements, such as diammonium phosphate (DAP) and the choice of fermentation conditions. This point highlights the need to monitor nitrogen not only in the vineyard but also in the must immediately before fermentation, so that appropriate additions can be made when required. Overall, optimisation of vineyard and fermentation nitrogen can contribute to quality factors in wine and hence affect its value. However, a better understanding of the effect of nitrogen on grape secondary metabolites and different types of nitrogen sources on yeast flavour metabolism and wine sensory properties is still required.

Bell, S-J., Henschke, P. A. (2005) Implications of nitrogen nutrition for grapes, fermentation and wine. *Australian Journal of Grape and Wine Research* **11**, 242-295.

Estudo do ecossistema microbiológico na superfície do bago da uva através da contagem e identificação das leveduras e bactérias

Palavras-chave : uva, bago, levedura, bactéria, biofilme, interação

Abstract

Microbial species present on the surface of grape berries at harvest play an important role in winemaking, thus counting and identifying them is of great importance. The use of conventional microbial techniques and molecular methods allowed a quantitative and qualitative inventory of the different microbial species present on the grape berries. These experiments were carried out in several areas of the Bordeaux region on the red grape varieties Merlot, Cabernet Sauvignon and Cabernet Franc. Populations and species clearly varied according to berry development stage. The most widespread yeast species at berry set, *Aureobasidium pullulans* was never detected at harvest. Fermentative yeasts were detected at harvest and not in the first stage of grape growth. *Qenococcus aeni* was detected on immature as well as on mature berries. *Gluconobacter oxydans* was detected mainly at harvest. Detection of *Pediococcus parvulus*, was dependent on the vineyard. Veraison appeared to be a key stage for yeast colonisation and the increase in population involved a change in the proportion of each species. The number of *A. pullulans* fell significantly at veraison as it was superseded by fermentative yeasts. Microbial populations peaked at harvest when the berry surface available for adhesion was largest and no agrochemical treatments had been applied for some weeks. Soil, grape variety and grapegrowing practices may also influence this microbial ecosystem. Based on these and published data, we formulated hypotheses to describe this microbial ecosystem, thus enabling us to develop the concept of a microbial biofilm.

Renouf, V., Claisse, O., Lonvaud-Funel, A. (2005) Understanding the microbial ecosystem on the grape berry surface through enumeration and identification of yeast and bacteria..

Renouf, V., Claisse, O., Lonvaud-Funel, A. (2005) Understanding the microbial ecosystem on the grape berry surface through enumeration and identification of yeast and bacteria. *Australian Journal of Grape and Wine Research* **11**, 316-327.

BULLETIN DE L'OIV

A importância da dieta e do estado de saúde nos potenciais efeitos cardioprotectores e outros efeitos benéficos do vinho

Palavras-chave : vinho, fenóis, dieta mediterrânea, síndrome metabólica, diabetes, doença cardiovasculares

Abstract

Un artículo reciente en el *New England Journal of Medicine* concluye que un "mayor seguimiento de la dieta tradicional mediterránea está asociado a una reducción significativa de la mortalidad total". Esta conclusión se vio corroborada por un estudio de seguimiento realizado durante 30 años en siete países acerca de la relación entre la dieta y las enfermedades cardiovasculares y el cáncer. Los componentes beneficios de una dieta de tipo mediterráneo incluyen el consumo diario de fruta, verdura y vino, que normalmente contienen una alta concentración de compuestos fenólicos, que se han asociado a un menor riesgo de padecer enfermedades cardiovasculares.

Dicho artículo analiza la idea de que el consumo moderado de vino complementa los efectos cardioprotectores de una dieta ya rica en fenoles, y lo que es más importante, contrarresta los efectos nocivos de una dieta rica en grasas sobre la coagulación sanguínea, la función endotelial y la oxidación de los lípidos, factores que contribuyen al desarrollo de

enfermedades cardiovasculares. No obstante, si los sujetos siguen una dieta baja en fenoles, el consumo periódico de vino tinto no implica una mejora a corto plazo de la función endotelial ni evita la oxidación de los lípidos, como el LDL.

Asimismo, el artículo estudia la hipótesis de que un consumo moderado de vino reduce el riesgo de padecer enfermedades cardiovasculares y otras patologías en sujetos con 'síndrome metabólico', al tiempo que comenta los mecanismos biológicos potenciales del vino que reducen dicho riesgo. Por ejemplo, los sujetos obesos que consumen vino de forma regular tienen mucho menos probabilidades de padecer diabetes, tienen una sensibilidad a la insulina notablemente mejor y muestran un perfil de lípidos en la sangre más saludable. Sobre la base de estas observaciones, el artículo concluye que los facultativos médicos quizás deban revisar los consejos dietéticos relativos al consumo de vino que dan a los pacientes con un alto riesgo de padecer enfermedades cardiovasculares.

Stockley, C. S. (2005) The importance of background diet and disease-state on the potential cardioprotective and other health effects of wine. *Le Bulletin de L'OIV* **78**, 497-508.

JOURNAL INTERNATIONAL DE LA VIGNE ET DU VIN

Estudo e validação do doseamento dos cloroanisóis e TCA em vinho e macerações hidroalcoólicas de rolhas de cortiça por SIDA-HSSPME-GC-MS/EI-SIM

Palavras chave : *cloroanisóis, TCA, vinho, rolhas de cortiça, validação estatística.*

Abstract

The work we present in this article aims at optimising and validating the assay technique based on SIDA-HSSPMEGC-MS/EI-SIM by means of intra-laboratory trials (NF V03-110 AFNOR 1998 and MA-F-AS1-06-PROVAL (OIV)) on several chloroanisoles (2,4,6-trichloroanisole, 2,3,4,6-tetrachloroanisole, 2,3,4,5,6-pentachloroanisole) likely to contaminate wine by direct or indirect contact, in order to define the precise characteristics and limitations of the method.

We showed this technique to be a specific, accurate, linear, and repeatable method. Moreover, seeing the increasing reliance on this type of approach in scientific research and industrial monitoring laboratories (ISSO/TC87/GT10) to assess the quality of cork stoppers and because of the important quantity of 2,4,6-Trichloroanisole present in this kind of material, we deemed appropriate to carry out an inter-laboratory study (ISO 5725-1,2,3,4 and 5) of TCA assays on dilute alcohol soaks of corks using the same method. Our results should make it easier to understand and interpret assay results obtained in different laboratories using the same technique.

Chatonnet, P., Labadie, D., Boutou, S. (2005) Study of chloroanisoles assay and TCA assay validation in wine and cork stoppers soaked in dilute alcohol solution using SIDA-HSSPME-GC-MS/EI-SIM. *Journal International des Sciences de la Vigne et du Vin*, **39**, 137-147.

REVUE FRANÇAISE D'OENOLOGIE

Vinhos brancos: as boas práticas de vinificação de uvas alteradas

Palavras chave : *uvas alteradas, Botrytis cinerea, vinificação, boas práticas*

Abstract

Évaluation des dégâts à la vigne, calendrier de récolte ajusté en fonction des objectifs de produits, de la maturité et des dégâts, separation des lots en fonction du niveau de pourriture et vinifications séparées, sont les bases universelles du travail des raisins, quand il y a une forte pression du Botrytis.

Ici, nous n'abordons que la partie vinification des lots avec des raisins atteints, une fois que les étapes ci-dessus ont été bien gérées. Depuis une quinzaine d'années, l'I.C.V. a expérimenté, et validé en cave, différentes techniques sur les raisins altérés dans les conditions méditerranéennes et rhodaniennes. La suite passe en revue ces techniques, et en particulier leur importance pour le millésime 2004.

Delteil, D., (2005) Vins blancs: les bonnes pratiques de vinification des raisins altérés. *Revue Française d'Oenologie* **213**, 11-14.

As leveduras híbridas, um instrumento excepcional para as fermentações

Palavras chave : *selecção de leveduras, hibridação, fermentação, vinho*

Abstract

Sans remettre en question le principe selon lequel “le vin se fait a la vigne”, on reconnaît aujourd’hui la contribution importante des souches de levures selectionnées au style du vin. Les vinificateurs ont desormais admis le rôle majeur de *Saccharomyces cerevisiae*, et la demande en nouvelles souches de levures, de plus en plus performantes, est sans cesse croissante. Au-dela de la transformation des sucres en alcool, qui doit être complete et sans déviation aromatique, les levures doivent également posséder de nombreuses autres propriétés. Il existe, actuellement, une demande pour des levures mieux adaptées aux différentes regions viticoles, aux cepages, aux méthodes culturales, et aux techniques de vinification et de fermentation.

Cet article passe en revue les programmes de selection et d’hybridation pour l’obtention de levures performantes, au sein de différents instituts sud-africains. Il montre aussi comment les nouvelles technologies peuvent être développées et utilisées pour élargir la gamme de levures oenologiques, et améliorer la compétitivité de la filière viti-vinicole.

Pour obtenir de nouvelles souches de levures, il existe trois possibilités par selection de levures existantes, par croisement de levures (technique de “breeding” ou d’hybridation), par transformation génétique.

Van Rensburg, P., (2005) Les levures hybrides, un outil exceptionnel pour les fermentations. Revue Française d’Oenologie **213**, 15-17.

A “thermo-détente”, uma nova dimensão aplicada à termovinificação

Palavras chave : *thermo-détente, termovinificação, extracção da cor, degustação*

Abstract

La qualité d’un vin rouge depend de nombreux facteurs, ceux déterminant la matière première, et ceux relatifs au travail du vigneron en cave. Dans la vinification, le travail d’extraction a un rôle de premier plan, dans le façonnage du style du vin. Cette opération mobilise beaucoup de place et de moyens, et l’ingénierie oenologique s’est toujours employée à trouver des méthodes permettant d’effectuer des gains en la matière. C’est notamment la finalité des vinificateurs continus, de la thermovinification, et, d’une certaine manière, de la flash détente.

La thermovinification reste, ainsi, assez largement employée dans les grosses unités de production, car elle offre une grande souplesse, en matière de capacité de traitement des flux de vendange, et, de plus, en chauffant la vendange, elle permet l’élimination des activités enzymatiques, notamment laccase, pouvant être apportées par un mauvais état sanitaire de la vendange.

Néanmoins, cette technique ne permet qu’une extraction assez limitée, aboutissant à des vins rouges souples et légers. En pratique, elle est donc plutôt réservée aux vendanges les plus courantes, les raisins de meilleures qualités étant généralement traités par des méthodes d’extraction traditionnelles.

Introduite assez récemment, la thermo-détente est un module technique qui s’intègre dans la chaîne de thermovinification, et dont le but est d’accroître le niveau d’extraction.

Dubernet, M., De Parzia, E., Dufort, B., Fontaine, P. (2005) La thermo-détente, une nouvelle dimension apportée à la thermovinification. Revue Française d’Oenologie **214**, 24-28.

REVUE DES OENOLOGUES

Dominar a fermentação malolática: um meio eficaz para proteger a qualidade e a tipicidade dos vinhos

Palavras chave : *fermentação malolática, qualidade, tipicidade, barricas.*

Abstract

Reconnue comme une étape prépondérante dans le processus de vinification, elle est plus souvent subie que gérée. Ce manque de maîtrise d’une phase clé de l’élaboration des vins peut entraîner une forte dépréciation de la qualité (perte de typicité, altérations organoleptiques, risques d’instabilité, production d’amines biogènes dangereuses pour la santé). Or, la concurrence actuelle sur le marché des vins et l’exigence croissante des consommateurs pour des produits sains obligent les praticiens à une parfaite connaissance et un contrôle total de la chaîne de vinification.

Si en France le vinificateur dispose aujourd’hui d’une vingtaine de souches d’*Enococcus oeni* sélectionnées, force est de constater que l’utilisation de ferments lactiques reste très marginale. Et ce malgré la souplesse d’utilisation des ferments lactiques acquise avec le procédé MBR® qui permet l’ensemencement direct dans le vin après une phase de réhydratation.

Escot, A., Sergent, D., Pillet, O., (2005) Maîtriser la fermentation malolactique: un moyen efficace pour protéger la qualité et la typicité des vins. Revue des Oenologues **116**, 19-23

Gestão da micro-oxigenação e da fermentação maloláctica em vinhos tintos

Palavras chave : *micro-oxigenação, fermentação maloláctica, vinho tinto.*

Abstract

La micro-oxygénation des vins rouges en cours de vinification et d'élevage s'est beaucoup développée ces dix dernières années suite aux travaux illustrant l'intérêt de l'apport dosé d'oxygène sur l'évolution et la structuration des composés phénoliques (Lemaire, 1995; Moutounet et al., 1995; Atanasova et al., 2002).

D'un point de vue pratique, la micro-oxygénation est généralement pratiquée à deux moments clés de la vinification, avant fermentation malolactique pour contribuer à la formation de ponts éthanal entre les anthocyanes et les tannins d'une part, après fermentation malolactique d'autre part avec un triple objectif de structuration, de polymérisation des composés phénoliques et de contribution à l'expression aromatique des vins en cours d'élevage.

Lorsqu'elle est pratiquée avant la fermentation malolactique, la micro-oxygénation n'est pas toujours menée en tenant compte de la gestion de la fermentation malolactique car l'ajout de SO₂ à des doses variables est souvent pratiqué pour retarder le démarrage de cette fermentation. Or, les bactéries lactiques sont sensibles aux paramètres du milieu tels que le titre alcoolométrique, le pH, la teneur en nutriments, les interactions levures-bactéries, la température mais également le SO₂ sous forme libre et combinée (Liu et Gallander, 1983, Pilatte, 1996). Par ailleurs, il convient de rappeler que l'ajout de SO₂ après la fermentation alcoolique retarde l'efficacité de la micro-oxygénation car l'oxygène apporté se combine préférentiellement au SO₂ et non pas aux polyphénols.

L'objectif de cette étude est d'analyser l'incidence de l'inhibition des bactéries lactiques indigènes réalisée après macération sur la maîtrise de la micro-oxygénation. Deux molécules ont été comparées, le lysozyme connu pour son action spécifique sur les bactéries lactiques (Gerbaux et al., 1997; Pilatte et al., 2000) et le dioxyde de soufre (SO₂) qui présente un spectre d'inhibition des micro-organismes plus large et moins spécifique.

Pillate, E., Cauchy-Alvin, B., Crachereau, J-C., Gervais, J-P (2005) Gestion de la micro-oxigenação et de la fermentation malolactique des vins rouges. *Revue des Œnologues* **116**, 24-28

Optimização das etapas pré-fermentativas das vinificações de vinho branco com uma formulação enzimática adequada. Balanço dos ensaios realizados em França ao longo da campanha de vinificação de 2004

Palavras chave : *enzimas, pré-fermentativa, vinho branco.*

Abstract

Les performances d'une préparation enzymatique spécifique des opérations pré-fermentaires de vinification en blanc (macération pelliculaire, égouttage, pressurage), ont été testées dans le Languedoc en 2004, dans des conditions de vinification variées. L'efficacité de cette préparation enzymatique, spécialement formulée pour assurer l'hydrolyse complète des polysaccharides pectiques du raisin, a été confirmée. Les essais réalisés ont permis de suivre les conditions d'égouttage, de pressurage et de débordage et ont démontré les avantages liés à l'utilisation de cette enzyme, commercialisée par DSM Food Specialties sous le nom Rapidase® X Press.

Fernandez, O., Bajard-Sparrow, C., Fauveau, C., Pellerin, P., (2005) Optimisation des étapes préfermentaires des vendanges blanches avec une formulation enzymatique adaptée. Bilan des essais réalisés en France au cours de la campagne de vinification 2004. *Revue des Œnologues* **116**, 29-31.

VITICULTURA

AMERICAN JOURNAL OF ENOLOGY AND VITICULTURE

Atributos sensoriais dos vinhos "Cabernet Sauvignon" obtidos a partir de videiras com diferentes rendimentos na colheita

Palavras chave : *evolução sensorial, poda, monda dos cachos, rendimento, intervenções em verde*

Abstract

Crop yield is widely recognised as an important factor in the quality of resultant wines, but most prior research has shown no effect of yield on wine quality. The role of yield in the sensory properties of *Vitis vinifera* L. cv. Cabernet Sauvignon was tested using pruning and cluster thinning to manipulate yield. Cabernet Sauvignon vines in the Napa

Valley were subjected to six winter pruning treatments over two vintages and eight cluster-thinning treatments over one vintage, with thinning imposed at veraison. The treatments created yields that varied from 4.3 to 22.2 t/ha. Descriptive analysis conducted on the resulting wines demonstrated significant differences in several sensory attributes. Analysis of variance and principal component analysis showed that the wines made from vines pruned to low bud numbers (hence “low yield”) were higher in veggie aroma and flavour, bell pepper aroma, bitterness, and astringency than “high-yield” wines. Conversely, the wines made from vines pruned to high bud numbers were higher in red/black berry aroma, jam aroma, fresh fruit aroma, and fruity flavour than low-yield wines. Regression analysis showed that, in general, veggie attributes decreased in intensity and fruity attributes increased in intensity as bud number and yield increased. In contrast, there were few sensory differences detected in wines made from the various cluster-thinning treatments, although the yield range was greater in that experiment than in the pruning experiment. We conclude that Cabernet Sauvignon aromas and flavours respond to yield manipulation, but do so significantly only when yield is altered early in fruit development.

Chapman, D., Matthews, M., Guinard, J.-X. (2004) Sensory Attributes of Cabernet Sauvignon Wines Made from Vines with Different Crop Yields. *American Journal of Enology and Viticulture* **55**, 325-334

Déficit de irrigação e nutrição mineral na videira

Palavras chave : *Vitis vinifera*, stress hídrico, irrigação, azoto, fotossíntese, transpiração, crescimento, rendimento, composição do fruto

Abstract

Water and nutrients exist together in close association because plant-available nutrient ions are dissolved in the soil solution and nutrient uptake by grapevines depends on water flow through the soil-root-shoot pathway. Leaf transpiration generates the tension necessary for the roots to absorb this essential solution, but in a drying soil, uptake of water and nutrients becomes progressively more difficult for grapevines. In addition, application of nitrogen fertilizer can increase the vine’s susceptibility to drought, because nitrogen favors shoot growth over root growth. However, because growth is more sensitive than photosynthesis to both water and nitrogen shortage, deficit irrigation may be used in conjunction with limited nitrogen application to control canopy development, yield, and fruit composition. Growth is the “pacemaker” for nutrient uptake by the vine, hence the growth reduction induced by water deficit also decreases vine nutrient requirements. Nevertheless, reducing water or nitrogen supply can be perceived as a stress by the vine, and its response depends on developmental status. For instance, water deficit applied before fruit set may reduce cluster and berry numbers, especially if combined with nitrogen shortage. Properly regulated deficit irrigation in combination with low to moderate rates of nitrogen application between bloom and veraison reduces canopy size, berry size, and yield, accelerates ripening, improves fruit color, and reduces disease incidence. However, this strategy also reduces yeast-assimilable nitrogen in the fruit, thereby increasing the risk of sluggish or stuck fermentation. Moreover, if the water or nitrogen deficit becomes too severe, fruit quality suffers from both limited assimilate supply and excessive fruit exposure to sunlight. The relationship between vine nutrition and deficit irrigation clearly requires careful guidance to make it a happy one.

Keller, M. (2005) Deficit Irrigation and Vine Mineral Nutrition. *American Journal of Enology and Viticulture* **56**, 267-283

AUSTRALIAN JOURNAL OF GRAPE AND WINE RESEARCH

Efeitos da temperatura e luz (antes e depois da rebentação) na morfologia da inflorescência e no número de flores na casta Chardonnay (*Vitis Vinifera* L.)

Palavras chave : *videira, Vitis vinifera* L, Chardonnay, inflorescência, flores, número de flores, diferenciação floral, temperatura, luz solar, rendimentos

Abstract

Plastic mini-chambers were used as tiny ‘glass houses’ to increase bud temperature in the vineyard. Open containers, with holes cut in them for ventilation, were used as controls, and inflorescences produced in those chambers were compared with inflorescences from modified chambers where either shade cloth or reflective foil were used to alter internal levels of photosynthetically-active radiation (PAR) as well as temperature. Buds were treated for either 14 days prior to budburst or for 13 days subsequent to budburst. Temperature and PAR were monitored immediately adjacent to the buds. Applied prior to budburst, the closed mini-chambers increased bud temperatures and reduced flower numbers per inflorescence. Both ‘clear’ and ‘reflective foil’ treatments resulted in similar flower numbers. However, the shading treatment increased flower numbers by approximately 13%. Prior to budburst, there was a significant but weak correlation between average temperature and flower number per inflorescence for both the basal and apical inflorescence. Average PAR was not significantly correlated with flower number on either inflorescence, and did not

improve the correlation when included with temperature in a multiple linear regression. Subsequent to budburst, flower numbers per inflorescence were decreased by the dosed container but were unaffected by either the shading or toil treatment. The correlation between temperature and flower number on the *apical* inflorescence was maintained but the correlation between temperature and flower number on the *basal* inflorescence was no longer apparent. These results suggest that temperatures encountered in a vineyard during budburst can influence the number of flowers per inflorescence to the extent of a 15 to 25% variation in flower number. PAR, apart from influencing bud temperature, does not appear to influence flower number. The effect of temperature on [lower differentiation diminishes as budburst.

Petrie, P. R., Clingeleffer, P.R. (2005) Effects of temperature and light (before and after budburst) on inflorescence morphology and flower number of Chardonnay grapevines (*Vitis vinifera* L.). Australian Journal of Grape and Wine Research **11**, 59-65

Determinação de simples indicadores de stress hídrico, baseado nas diferentes sensibilidades dos componentes do crescimento vegetativo

Palavras-chave : stress hídrico da planta, indicadores vegetativos, abrolhamento dos gomos, morfologia do gomo, condutância dos estomas, potencial hídrico foliar ao amanhecer, *Vitis vinifera* L.

Abstract

Responses of grapevine vegetative growth components to mild, medium and severe soil water deficits were used to identify simple and sensitive indicators for early diagnosis of water stress. Soil water deficit was characterized as the fraction of transpirable soil water (FTSW) remaining in a water-depleted rootzone. Growth components included the number of emerged leaves on first (1st) and second (2nd) order lateral branches, the leaf area and internode length of each phytomer of 1st order lateral branches, and the frequency of 2nd order lateral branching. These components were measured in a greenhouse on Shiraz (syn. Syrah) grapevines, over a 38-day period of stabilized soil water regimes. Leaf emergence rate, final leaf area and final internode length of lateral branches I were relatively insensitive to mild and medium water deficits. They only decreased in response to severe water deficits. The frequency of 2nd order lateral branching showed a similar trend, but was inhibited at severe water deficits. The leaf emergence rate of lateral branches II was highly sensitive to FTSW, and decreased even in response to mild water deficits. Because measurement of leaf emergence rate is a time consuming process, further analysis of the data was undertaken to identify a simpler but similarly effective indicator of cumulative water deficit. Accordingly, we established that the final length of lateral branches I was sensitive to medium water deficits, while the final ratio of the number of leaves on lateral branches II to the number of leaves on lateral branches I, was sensitive to even mild water deficits. Both of these composite indicators (derived variables) were relatively easy to measure and showed potential as early indicators of water deficits. They were more sensitive to FTSW than was predawn leaf water potential. Moreover, the final ratio of the number of leaves on lateral branches II to the number of leaves on lateral branches I was even more sensitive to FTSW than was stomatal conductance.

Pellegrino, A., Lebon, E., Simonneau, T., Wery, J. (2005). Towards a simple indicator of water stress in grapevine (*Vitis vinifera* L.) based on the Differential sensitivities of vegetative growth components. Australian Journal of Grape and Wine Research **11**, 306-315

BULLETIN DE L'OIV

Humidade do solo: um indicador de zonagem e de qualidade do vinho, também em explorações de pequena dimensão

Palavras Chave : humidade do solo, Merlot, Cabernet sauvignon, qualidade da uva, qualidade do vinho, análise sensorial, zonagem

Abstract

Las propiedades físicas del suelo y las dinámicas del agua son factores importantes que afectan a la expresión cualitativa de la vid. Por tanto, la caracterización hidráulica del suelo debe considerarse una herramienta fundamental en la investigación de la distribución zonal, y no un mero factor secundario de importancia menor. La investigación que a continuación se detalla fue llevada a cabo en una explotación de tamaño medio en Italia (70 ha), en la que fue posible aislar tres áreas en función de la textura y la humedad de sus suelos. El estudio revela que la composición de la uva y las características sensoriales del Cabernet Sauvignon y el Merlot están más relacionadas con la disponibilidad de agua que con la cosecha. Así, el estudio del rendimiento del suelo es crucial a la hora de elegir la mejor variedad y los mejores tratamientos enológicos para las diferentes áreas. Asimismo, esta investigación demostró que existían diferencias en los vinos elaborados con uva cultivada en suelos con contenidos distintos de grava, limo y arcilla. Los cambios en la composición han demostrado ser muy importantes en términos de posible posicionamiento en el mercado del vino.

Tomasi, D., Sivilotti, P., Pascarella, G., Raseira, M., Calò, A. (2005) Soil moisture: an indicator of zoning and wine quality also in small farm surfaces. Bulletin de l'OIV **78**, 447-459.

JOURNAL INTERNATIONAL DES SCIENCES DE LA VIGNE ET DU VIN

Efeitos do stress hídrico sobre a quantidade e a distribuição da matéria seca em quatro castas (*Vitis Vinifera* L.)

Palavras chave : *distribuição, localização do carbono, stress hídrico, órgãos da vinha*

Abstract

Three-year-old grapevines of four cultivars (Garnacha tinta (Grenache noir), Tempranillo, Chardonnay and Airén) were grown on 35 L container under full irrigation and restricted irrigation conditions in order to determine the effect of water stress on carbohydrate allocation. Total grapevine dry matter was measured at pruning, fruitset, veraison and harvest. Roots, wood, shoots, leaves and clusters were dried separately. Shoots were the most affected organs by water stress, while wood was the least affected. Vines under water stress partitioned more dry matter to wood and roots to the detriment of fruits and shoots. The period from fruitset to veraison was the most active for dry matter accumulation under conditions of stress, whereas non-water stressed vines accumulated more dry matter from veraison to harvest. Under both irrigation treatments, fruits competed with roots for dry matter partitioning. Irrigation treatment and cultivar determined fruit size. Fruit size determined dry matter partitioning between organs and the dry matter accumulation pattern.

Gomez-Del-Campo, M., Baeza, P., Ruiz, C., Lissarraque, J.R. (2005) Effects of water stress on dry matter content and partitioning in four grapevine cultivars (*Vitis vinifera* L.). *Journal International des Sciences de la Vigne et du Vin* **39**, 1-10

Caracterização da composição geológica das parcelas de vinha de Gaillac (Tarn, Midi-Pyrénées) incidências sobre a determinação de unidades de “terroir” de base e sobre a escolha do material vegetativo

Palavras chave : *AOC Gaillac, geologia, morfologia, material vegetativo, efeito “terroir”*

Abstract

Detailed geological analyses of plots belonging to the ‘AOC Gaillac’ area have been carried out in order to address one of the main natural components ruling the terroir effect process. These plots belong to terraces of the left bank of the Tarn river which coincides with one of the three main terroirs of the AOC area. Precisely, the analysed plots are localised on the Rissian-aged (~ 200 000 yrs B.P.) terrace composed of alluvial shelves crosscut by small valleys where the Oligocen (ca. 28 My) marly molassic basement outcrops. Three different Basic Terroir Units (BTU) have been identified: terrace shelf, terrace slope and comb. Each of them has specific viticultural potentialities related to its topographical, geological and pedological characteristics. Representative profiles have been analysed in each BTU. Field analysis has evidenced that all rocks material have derived from Rissian alluvial deposits due to solifluxion processes when part of the alluvial material deposited on the terrace shelf has slept onto the slope overlying the marly Oligocen molassic basement. This solifluxion phase has taken place during the late-glacial Wurmian climatic oscillations interval (Bollering-Alerod episode ca. 12,000 years BP). Afterwards, during the Holocene period (i.e. the last 10,000 years) the alluvial-derived material has suffered pedogenetic alteration. The nature of the resulting alterites depends on the initial topographic situation inherited from the late-Wurmian solifluxion phase. On the terrace shelf the soil sequence begins by a reddish clayey horizon (up to 0,6m) because of the erosion of the eluvial horizon during the last 10,000 years. It is followed by a thick (~ 1m average) reddish coarse-pebble horizon rich in clays and iron oxides. On the terrace slope, characteristic Luvisols have developed composed by an eluvial silty-sandy horizon (up to 0.60m) overlying an illuvial pebble-sand level (up to 3m) where clays and ferrous oxides are moderately accumulated. Finally, the thick (> 2m) dark silts and clays sequence (with scattered gravels and small pebbles) of the comb derive from the deposition of eroded soil material of the above terrace shelf and slope units (colluvium).

On the basis of the role of high qualitative limiting factor played by the water stress parameter such as quality of drainage, permeability of soils, the down-side slope terrace unit appears as the most appropriate unit because of its slope gradient combined with the occurrence of a thick permeable pebble-sand sequence. Finally, combination of physical and chemical results - acidic pH and very low CEC - permits to recommend the Gravesac rootstock adapted to well-drained acidic soils and Syrah/Fer Servadou climatic-adapted grapevine varieties as the most suitable vegetative material. In addition, the knowledge of the geological component at the scale of the basic units allows for the adaptation of some cultural practices in order to enhance the viticultural potentialities of the plots. In order to encourage the vine's roots to dig deep and reach the sandy-pebbles horizon, two cultural possibilities are proposed: inter-row grassing associated with the «inter-plant» method or earthing down under the row associated with inter-row ploughing. The choice will depend on the soil erosion amplitude if the inter-row ploughing method is used.

The analysis demonstrates the efficiency of detailed geological survey using BTU concept as an operational tool. Further, it enhances that the geological component can be regarded as an amplification point of the terroir system as any

alteration - even of minor importance - of the geological parameters, may have noticeable consequences on the resulting terroir effect.

Courjault-Rade, P., Munoz, M., Hirissou, N. (2005) Geological Characteristics of Plots Belonging to the Gaillac Vineyard (Tarn, Midi-Pyrénées). Consequences on the Determination of Basic Terroir Units (BTU) and the Choice of Vegetative Material. *Journal International des Sciences de la Vigne et du Vin* **39**, 95-107

Importância da Eutipiose e da Esca na Argélia e estrutura da comunidade fúngica associada

Palavras chave : *Eutipiose, esca, degradação do lenho*

Abstract

A preliminary survey performed in Algeria in 2003, revealed high percentages of dead vines and of vines affected by either *Eutypa* dieback or esca. *Eutypa* dieback appeared more frequent than esca. Cross sections revealed different types of lesions whose frequency did not correlate with external symptoms. The main lesions were : black spots corresponding to plugged vessels, a central brown hard or soft lesion, a white rot lesion (amadou) and a sectorial brown hard lesion. The most frequent fungi isolated from the lesions were *Phaeoconiella chlamydospora*, *Phaeoacremonium aleophilum*, *Batrachosphaeria* spp., *Fomitiporia mediterranea*, *Phomopsis viticola* et *Eutypa lata*. Several types of lesions and several fungi were encountered in the same vine. The association of fungi with lesions and their role in the functioning of the fungal community are discussed.

Berraf, A., Peros, J.-P. (2005) Importance of *Eutypa* Dieback and Esca in Algeria and Structure of the Associated Fungal Community. *Journal International des Sciences de la Vigne et du Vin* **39**, 121-128

REVUE FRANÇAISE D'OENOLOGIE

Efeito estufa: as emissões ligadas à elaboração e à comercialização dos vinhos Champagne

Palavras Chave : *efeito estufa; clima; vinha*

Abstract

Dans un contexte où le réchauffement climatique et ses causes ne font plus aucun doute au sein de la communauté scientifique internationale, il est apparu opportun, aux professionnels, de réaliser une estimation des émissions de gaz à effet de serre (G.E.S.) de l'ensemble de la Champagne. La méthode utilisée, le bilan carbone, a été mise au point récemment pour le compte de l'ADEME (Agence de l'Environnement et de la Maitrise de l'Energie) et de la MIES (Mission Interministérielle de l'Effet de Serre).

Descôtes, A., Moncomble, D. (2005) Gaz à effet de serre: les émissions liées à l'élaboration et à la commercialisation des vins de Champagne. *Revue Française d'Oenologie* **213**, 4-7

REVUE DES OENOLOGUES

Maturação das uvas: proposta de método utilizando o volume dos bagos como indicador

Palavras chave : *maturação, uva, açúcares, ácidos*

Abstract

L'obtention d'une maturité optimale est essentielle pour la réalisation d'un vin de qualité. Différentes techniques sont utilisées pour évaluer la maturité du raisin. La concentration en sucres (Titre Alcoométrique Probable ou TAP) et en acides (acidité totale) sont des indicateurs utilisés en routine par les maîtres de chai et les oenologues. Le rapport sucres sur acides ou indice de maturation, couramment calculé, doit être utilisé avec précaution. En effet, l'augmentation des sucres n'est pas liée par un phénomène biochimique direct à la diminution des acides (*Ribéreau-Gayon et al., 1998*). Il faut donc s'intéresser aussi aux valeurs propres des deux composantes de ce rapport, et considérer ce rapport dans une échelle spécifique à chaque cépage.

La notion de maturité évolue, les différents acteurs de la filière font intervenir d'autres indicateurs comme la dégustation de baies, le rapport entre la concentration en acide tartrique et en acide malique notamment (*Ribéreau-Gayon et al., 1998*). Certes, les concentrations en sucres et en acides sont des paramètres essentiels qui intéressent directement le vinificateur, mais ils ne suffisent pas pour appréhender de manière complète la maturité du raisin, ni pour

suivre la maturation dans sa complexité. La maturité phénolique reste difficile estimer, en effet la technique de la dégustation de baie, si elle est pertinente reste toutefois limitée en terme d'échantillonnage.

Brenon, E., Bernard, N., Zebic, O., Deloire, A. (2005) Maturité du raisin: proposition d'une methode utilisant le volume des baies comme indicateur. *Revue des Oenologues*, **117**, 52-54

História do clima e da viticultura

Palavras chave : *clima; viticultura*

Abstract

A palavra clima apareceu no século XII. Esta palavra significa etimologicamente, inclinação e latitude. Emanuel de Martonne definiu o clima em 1909, no seu *Tratado de Geografia Física*, como « homogeneidade de fenómenos, tais como a temperatura, vento, humidade, chuva, numa correlação estreita que dá a cada região uma fisionomia que se reflecte na sua própria vegetação ».

Rochar, J., Srhiyeri, A. (2005) Histoire du climat et viticulture : Evolution des dates de vendange en liaison avec les changements climatiques *Revue des Oenologues* **117**, 48

Legislação Comunitária

JORNAL OFICIAL DA UNIÃO EUROPEIA
48º ANO, SÉRIE L, ABR-SET, 2005

Regulamento (CE) n.º 616/2005 da Comissão, de 21 de Abril de 2005, que altera o Regulamento (CE) n.º 1623/2000 que fixa, no respeitante aos mecanismos de mercado, as regras de execução do Regulamento (CE) n.º 1493/1999 do Conselho que estabelece a organização comum do mercado vitivinícola.

JOUE L 103, de 22-04-2005

Regulamento (CE) n.º 761/2005 da Comissão, de 19 de Maio de 2005, que abre a destilação de crise referida no artigo 30.º do Regulamento (CE) n.º 1493/1999 do Conselho para certos vinhos em França.

JOUE L 127, de 20-05-2005

Regulamento (CE) n.º 762/2005 da Comissão, de 19 de Maio de 2005, que abre a destilação de crise referida no artigo 30.º do Regulamento (CE) n.º 1493/1999 do Conselho para certos vinhos em Espanha.

JOUE L 127, de 20-05-2005

Regulamento (CE) n.º 922/2005 da Comissão, de 17 de Junho de 2005, relativo à emissão de certificados de exportação no sector vitivinícola.

JOUE L 156, de 18-06-2005

Regulamento (CE) n.º 962/2005 da Comissão, de 23 de Junho de 2005, relativo à emissão de certificados de exportação no sector vitivinícola.

JOUE L 164, de 24-06-2005

Regulamento (CE) n.º 1074/2005 da Comissão, de 7 de Julho de 2005, que altera o Regulamento (CE) n.º 1227/2000 que estabelece normas de execução do Regulamento (CE) n.º 1493/1999 do Conselho que estabelece a organização comum do mercado vitivinícola, no referente ao potencial de produção.

JOUE L 175, de 08-07-2005

Regulamento (CE) n.º 1163/2005 da Comissão, de 19 de Julho de 2005, que altera o Regulamento (CE) n.º 1622/2000 que estabelece determinadas normas de execução do Regulamento (CE) n.º 1493/1999, que estabelece a organização comum do mercado vitivinícola, e constitui um código comunitário das práticas e tratamentos enológicos.

JOUE L 188, de 20/07/2005

Regulamento (CE) n.º 1153/2005 da Comissão, de 18 de Julho de 2005, relativo à abertura de um concurso para a venda de álcool de origem vínica com vista à sua utilização sob a forma de bioetanol na Comunidade.

JOUE L 187, de 19/07/2005

Regulamento (CE) n.º 1215/2005 da Comissão, de 28 de Julho de 2005, que altera o Regulamento (CE) n.º 1990/2004 que estabelece medidas transitórias no sector vitivinícola na sequência da adesão da Hungria à União Europeia.

JOUE L 199, de 29/07/2005

Regulamento (CE) n.º 1216/2005 da Comissão, de 28 de Julho de 2005, que altera o Regulamento (CE) n.º 1227/2000 que estabelece normas de execução do Regulamento (CE) n.º 1493/1999 do Conselho que estabelece a organização comum do mercado vitivinícola, no referente ao potencial de produção.

JOUE L 199, de 29/07/2005

Regulamento (CE) n.º 1219/2005 da Comissão, de 28 de Julho de 2005, que altera o Regulamento (CE) n.º 1623/2000 que fixa, no respeitante aos mecanismos de mercado, as regras de execução do Regulamento (CE) n.º 1493/1999 do Conselho que estabelece a organização comum do mercado vitivinícola.

JOUE L 199, de 29/07/2005

Regulamento (CE) n.º 1293/2005 da Comissão, de 5 de Agosto de 2005, que altera o Regulamento (CEE) n.º 2676/90 que determina os métodos de análise comunitários aplicáveis no sector do vinho.

JOUE L 205, de 06/08/2005

Regulamento (CE) n.º 1294/2005 da Comissão, de 5 de Agosto de 2005, que altera o anexo I do Regulamento (CEE) n.º 2092/91 do Conselho relativo ao modo de produção biológico de produtos agrícolas e à sua indicação nos produtos agrícolas e nos géneros alimentícios.

JOUE L 205, de 06/08/2005

Regulamento (CE) n.º 1336/2005 da Comissão, de 12 de Agosto de 2005, que altera o anexo III do Regulamento (CEE) n.º 2092/91 do Conselho relativo ao modo de produção biológico de produtos agrícolas e à sua indicação nos produtos agrícolas e nos géneros alimentícios.

JOUE L 211, de 13/08/2005

Regulamento (CE) n.º 1481/2005, de 13 de Setembro de 2005, que altera o Regulamento (CE) n.º 2805 / 95 que fixa as restituições à exportação no sector vitivinícola.

JOUE L 237, de 14/09/2005

Regulamento (CE) n.º 1512/2005 da Comissão, de 15 de Setembro de 2005, que altera o Regulamento (CE) n.º 753/2002 que fixa certas normas de execução do Regulamento (CE) n.º 1493/1999 do Conselho no que diz respeito à designação, denominação, apresentação e protecção de determinados produtos vitivinícolas.

JOUE L 241, de 17/09/2005

Regulamento (CE) n.º 1530/2005 da Comissão, de 21 de Setembro de 2005, que abre a destilação de crise referida no artigo 30º do Regulamento (CE) n.º 1493/1999 do Conselho para os vinhos de mesa em Itália.

JOUE L 246, de 22/09/2005

JORNAL OFICIAL DA UNIÃO EUROPEIA
48º ANO, SÉRIE C, ABR-SET, 2005

2005/C 213/01 - Lista dos organismos e dos laboratórios designados pelos países terceiros para preencherem os documentos que devem acompanhar qualquer importação de vinho para a Comunidade [Artigo 29º do Regulamento (CE) n.º 883/2001 da Comissão].

JOUE C 213, de 31/08/2005

2005/C 228/03 - Aviso de início de um processo de exame relativo a entraves ao comércio, na aceção do Regulamento (CE) n.º 3286/94 do Conselho, constituídos por medidas e práticas aplicadas pela Índia que afectam o comércio de vinhos e bebidas espirituosas.

JOUE C 228, de 17/09/2005

Legislação Nacional

DIÁRIO DA REPÚBLICA
SÉRIE I – A e B, ABR-SET, 2005

Declaração de rectificação n.º 27/2005 de ter sido rectificadada a Portaria n.º 131/2005, do Ministério da Agricultura, Pescas e Florestas, que aprova o Regulamento de Controlo e Certificação dos Produtos Agrícolas e dos Géneros Alimentícios Derivados de Produtos Agrícolas Obtidos através da Prática da Protecção Integrada e da Produção Integrada, publicada no Diário da República, 1.ª série, n.º 23, de 2 de Fevereiro de 2005.

Presidência do Conselho de Ministros

DR 68 Série I-B, de 07/04/2005

Portaria n.º 457/2005 que Altera a Portaria n.º 1259/2001, de 30 de Outubro, que estabelece para o continente as normas complementares de execução do regime de apoio à reconversão e reestruturação das vinhas e fixa os procedimentos administrativos aplicáveis à concessão das ajudas previstas. Revoga a Portaria n.º 1141/2004, de 13 de Setembro.

Ministério da Agricultura, do Desenvolvimento Rural e das Pescas
DR 84, Série I - B, de 02/05/2005

Portaria n.º 558/2005 que estabelece para o continente as normas complementares de execução do regime de apoio à reconversão e reestruturação das vinhas e fixa os procedimentos administrativos aplicáveis à concessão das ajudas previstas para a campanha vitivinícola de 2005-2006. Revoga a Portaria n.º 1259/2001, de 30 de Outubro.

Ministério da Agricultura, do Desenvolvimento Rural e das Pescas
DR 122, Série I - B, de 28/06/2005

Decreto-Lei n.º 150/2005 que transpõe para a ordem jurídica interna a Directiva n.º 2004/45/CE, da Comissão, de 16 de Abril, que altera a Directiva n.º 96/77/CE, que estabelece os critérios de pureza específicos dos aditivos alimentares, com excepção dos corantes e dos edulcorantes, alterando o Decreto-Lei n.º 365/98, de 21 de Novembro.

Ministério da Agricultura, do Desenvolvimento Rural e das Pescas
DR 166, Série I - A, de 30/08/2005

Decreto-Lei n.º 154/2005 que actualiza o regime fitossanitário que cria e define as medidas de protecção fitossanitária destinadas a evitar a introdução e dispersão no território nacional e comunitário, incluindo nas zonas protegidas, de organismos prejudiciais aos vegetais e produtos vegetais qualquer que seja a sua origem ou proveniência, transpondo para a ordem jurídica interna as Directivas n.os 2002/89/CE, do Conselho, de 28 de Novembro, 2004/102/CE, da Comissão, de 5 de Outubro, 2004/103/CE, da Comissão, de 7 de Outubro, 2004/105/CE, da Comissão, de 15 de Outubro, 2005/15/CE, do Conselho, de 28 de Fevereiro, 2005/16/CE, da Comissão, de 2 de Março, 2005/17/CE, da Comissão, de 2 de Março, e 2005/18/CE, da Comissão, de 2 de Março.

Ministério da Agricultura, do Desenvolvimento Rural e das Pescas
DR 171, Série I - A, de 06/09/2005

Outras Publicações Periódicas

NACIONAIS	ESTRANGEIRAS
Ciência e Técnica Vitivinícola Enologia Gazeta das Aldeias Hipersuper Néctar O Escanção Portuguese Wines Qualidade (APQ) SineQuanon (IPQ) Revista de Vinhos Revista do Agricultor Vida Rural	Bulletin d'Information de l'AIJDVV Decanter Magazine Drinks Buyer Europe Drinks International La Semana Vitivinicola Progrés Agricole et Viticole Quarterly Review of Wine Wine Spectator Wine and Spirits Wine Enthusiast