



CONCORSO PUBBLICO, PER ESAMI, A N. 1 POSTO DI CATEGORIA D - AREA TECNICA, TECNICO-SCIENTIFICA ED ELABORAZIONE DATI, CON RAPPORTO DI LAVORO SUBORDINATO A TEMPO INDETERMINATO PRESSO L'UNIVERSITÀ DEGLI STUDI DI MILANO - CENTRO FUNZIONALE AZIENDE AGRARIE D'ATENEIO (CFAA) - CODICE 22419

La Commissione giudicatrice del concorso, nominata con Determina Direttoriale n. 3175 dell'11/03/2024, composta da:

| | |
|------------------------------------|------------|
| Prof. Antonio Ferrante | Presidente |
| Prof. Matias Pasquali | Componente |
| Dott.ssa Lisa Pirovano | Componente |
| Dott.ssa Katia Paola Elena Righini | Segretaria |

comunica i quesiti relativi alla prova orale:

GRUPPO DI QUESITI N. 1

- Il/La candidato/a descriva i criteri per la scelta dei fitofarmaci in un frutteto composto da differenti specie di alberi da frutto evidenziando le norme pratiche relative all'acquisto, alla conservazione e all'uso dei fitofarmaci.
- Il/La candidato/a illustri i metodi di lotta integrata nel monitoraggio e difesa delle principali malattie di un frutteto.
- Lettura e traduzione dell'abstract (Fonte: Wang, X., Fan, Y., Yan, M., Tao, Z., He, D., Du, G., ... & Si, B. (2024). Direct characterization of deep soil water depletion reveals hydraulic adjustment of apple trees to edaphic changes. *Agricultural and Forest Meteorology*, 348, 109932.):

“Deep soil water is important for trees to survive droughts in arid and semiarid regions, but often irreversibly decrease as tree age due to limitations in soil infiltration rates and precipitation. How adaptable is the hydraulic system of trees undergoing the depletion of deep soil moisture reserves? To answer this question, we examined 12 traits characterizing the hydraulic structure of apple tree branches along a plantation age gradient (7 - 26 years) under uniform soil and climatic conditions. We found that almost all deep soil available water was consumed (reduced by up to 98%) as apple trees aged, as a result, the fraction of roots located in water deficit layers increased by up to 70%. Reduced water availability in deep soil significantly increased xylem embolism resistance (P50) by 8%, without altering xylem-specific hydraulic conductivity, vessel diameter, or vessel density.

A distinct adaptive response to permanently reduced deep soil water availability seems to occur primarily by increasing tree hydraulic safety with no reductions in hydraulic efficiency, through which mechanism trees may acclimatize to deep soil water reduction.”

GRUPPO DI QUESITI N. 2

- Il/La candidato/a illustri le forme di allevamento e le cure colturali dell'Actinidia.
- Il/La candidato/a descriva il funzionamento di un atomizzatore a basso volume evidenziando le differenze rispetto ad un atomizzatore a volume normale.
- Lettura e traduzione dell'abstract (Fonte: Gomez, L., Vercambre, G., & Jordan, M. O. (2020). Spatial-temporal management of nitrogen and carbon on the peach tree (*Prunus persicae* L. Batsch.). *Scientia Horticulturae*, 273, 109613.):

“In perennial plants, the management of nitrogen (N) and carbon (C) is crucial to their durability, and studies encompassing an integrative viewpoint on the dynamics, location and form of the reserves are still missing. The carbon and nitrogen components were measured from September to May in peach trees which received two different levels of N fertilisation (control and limited). Significant differences were observed in the N and non-structural carbon concentrations regarding the organs, locations, time and fertilisation



level. During the autumn, N and C accumulate at all levels of the tree and are sharply remobilised for the spring growth resumption. Amino acids (AA), especially arginine, appear to be the main form of storage of N. More present in roots, short branches and apices, the AA reach their maximum concentration in February and drop sharply with bud development. The remobilisation of the AA is initially induced in the branches close to the aboveground plant parts structures in formation, and before the contribution of the roots pool. The non-structural carbon (starch, soluble sugars, and organic acids) also accumulate during the autumn. No major differences are observed in the position and the size of the branches. The starch present in the root is the main form of carbon reserve of the peach tree. The starch stocks decline very early in November and are then gradually restored while the tree becomes autotrophic in the spring. The deprivation of N essentially caused a significant decrease in the stocks of AA and erased the differences in concentrations found in relation to the typology of branches. So the tree modified its N management strategy in response to the fertilisation level. The concentration of arginine, the main amino acid present in the bark or in the roots, appears as a relevant marker of its N status.”

GRUPPO DI QUESITI N. 3

- Il/La candidato/a descriva i metodi irrigui impiegati in frutticoltura.
- Il/La candidato/a descriva l'epoca di raccolta migliore e la gestione post-raccolta delle principali produzioni frutticole.
- Lettura e traduzione dell'abstract (Fonte: Pérez-Pastor, A., Ruiz-Sánchez, M. C., & Domingo, R. (2014). Effects of timing and intensity of deficit irrigation on vegetative and fruit growth of apricot trees. *Agricultural water management*, 134, 110-118.):

“The effect of different deficit irrigation strategies were studied over a four year period in mature apricot trees (*Prunus armeniaca* L., cv. Búlida) to ascertain how the intensity and duration of water deficit affects the growth of the root and aerial (shoot, trunk and fruit) parts of the tree, and hence future tree productivity. The irrigation treatments consisted of: a control, irrigated at 100% of seasonal crop evapotranspiration (ET_c); continuous deficit irrigation (CDI) at 50% of ET_c; two regulated deficit irrigation (RDI), at 100% of ET_c only during the critical periods, and reduced to various percentages of ET_c during the rest of the season. Soil and plant water status, yield, vegetative and fruit growth were measured in the different treatments. Vegetative growth decreased according to the intensity and duration of the water deficit applied, and depending on the phenological period when the water deficit occurred. Deficit irrigation promoted a decrease in trunk and shoot growth by a 33% on average, although root length density increased nearly double in the 0-0.25 m drip-line band compared with the Control trees. In the RDI treatments, trunk growth and pruning were significantly reduced only under severe water deficit conditions. While CDI proved to be detrimental for maintaining fruit yield due to the significant reduction in vegetative growth, which led to a decrease in the number of fruits per tree, the RDI treatments only led to reduced yields when the water deficits during the non-critical periods were severe, tree trunk growth being significantly reduced as a consequence. Also, fruit size and total yield decreased when deficit irrigation relief was delayed until after the onset of stage III. Overall, water saving up to 22% affected negatively to the total yield and the number of fruits per tree, by reducing the tree growth.”

GRUPPO DI QUESITI N. 4

- Il/La candidato/a descriva le principali tecniche di propagazione delle piante da frutto.
- Il/La candidato/a descriva i principali mezzi di protezione contro la grandine e agenti atmosferici.
- Lettura e traduzione dell'abstract (Fonte: Vamos, A., & Holb, I. J. (2019). Training system and tree-age affect leaf spot epidemics and tree defoliation on commercial sweet cherry cultivars. *Crop protection*, 125, 104881.):

In two 3-year studies, the effect of two training systems (free spindle versus super spindle) and two tree-age periods (4-6 versus 13-15 years) were evaluated on cherry leaf spot (CLS) epidemics and tree defoliation for 12 sweet cherry cultivars in an integrated orchard. Then, relationships among CLS infection periods, CLS incidences and percent defoliation were determined for the training systems and tree-age periods. In addition, cultivars were classified into three CLS susceptibility and three defoliation categories (low, moderate, and high). Annual CLS and defoliation incidences of individual cultivars were lower, by 0.05-10.8% and by 0.1-9.1%, respectively, on trees pruned to super spindle compared to trees pruned to free



spindle, except for defoliation incidences on cultivars 'Biggareau burlat' and 'Müncheberger', where training system had no effect. The three year means of CLS and defoliation incidences ranged from 18.0 to 70.5% and from 14.1 to 47.9%, respectively, on the 4-6 years old trees; and from 8.7 to 34.7% and 5.4-25.5%, respectively, on the 13-15 years old trees. Leaf spot infection period, CLS incidence and defoliation incidence showed strong relationship in both training systems in those years when annual CLS incidences were high. Cherry leaf spot and defoliation classification categories of some cultivars were different for the two training systems and/or for the two three-year periods. Our study demonstrated that both training system and tree-age can impact the severity of leaf spot epidemics and tree defoliation for sweet cherry genotypes showing moderate susceptibility to leaf spot.

Milano, 17 aprile 2024

La Commissione

Prof. Antonio Ferrante Presidente

Prof. Matias Pasquali Componente

Dott.ssa Lisa Pirovano Componente

Dott.ssa Katia Paola Elena Righini Segretaria