Effect of harvest time on yield and luteolin content in *Reseda luteola* L. grown in Central Italy

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Weld (*Reseda luteola* L., Family *Resedaceae*) is a herbaceous plant, native of Euro-Asia and naturalised in the Mediterranean region where it could represent a source of yellow pigments for the natural textiles production**.** Weld produces flavonoids, in the aerial part of the plant, the most important being luteolin (5,7,3',4' tetrahydroxyflavone), a very stable yellow pigment used mainly for dyeing wool and silk since ancient time. The cultivation of weld for the production of the dye represented the principal features of the Renaissance agriculture and commerce in Italy and France and during XV and XVI Centuries, weld was being cultivated in the Mediterrranean area as a source of yellow dye. Nowadays there is a renewed interest in natural dyes, in line with the current consumer trends towards natural products. In weld the colouring matter is concentrated mainly in the leaves, inflorescence and fruits , but no information is available on the proper harvest time in order to maximise yield and dye. During Middle Age plants were usually cut once time from beginning of anthesis to seed maturity, but this time usually last several weeks for the prolonged flowering that overlaps on fruit formation. The aim of the present research was to evaluate the proper harvest time and its effects on yield and the luteolin content in some accessions of *Reseda luteola* L. in order to assess its suitability to be grown in Italy as dye crop.

Three weld genotypes (*Reseda luteola* L., RE7; RE9 and RE17) were evaluated for their agronomic characteristics in a 2-year field study (1996 and 1997) carried out under rainfed condition in Central Italy. Luteolin content was determined by HPLC analysis.

Results demonstrated that in both years of experiments the harvest time affect overall dry yield. To harvest plants at flowering or about three weeks later at beginning of fruit ripening gave an increment in plant dry yield of 40% (3 and 5 tonnes per hectare respectively at flowering and beginning of fruit ripening). This increment was due to an higher development of inflorescences and fruits that increased 5-6 fold (5.5 and 25 dry g per plant at flowering and fruit maturity). The plants belonging to different genotypes produced a different amount of stems, inflorescences, fruits (capsules) and leaves. The stems have a poor content of luteolin therefore the best genotype was RE7 that showed plants with longer and more expanded inflorescences (18 g DM per plant) than RE9 and RE17 (16 and 11 g DM per plant).

The luteolin amount was inversely correlated with plant yield and it was higher at flowering than at beginning of seed maturity (21 and 12 mg g^{-1} dry weight respectively). Genetic variability existed for the luteolin content in leaves plus reproductive structures (inflorescences and fruits) that varied from 24, 22 and 14 mg g^{-1} dry weight in RE9, RE17 and RE7 respectively.