

## INTISARI

Kentang adalah komoditas yang berasal dari wilayah sub tropis, sehingga sangat sensitif terhadap suhu tinggi. Kendala utama pengembangan komoditas kentang di Indonesia yaitu keterbatasan wilayah dataran tinggi bersuhu rendah dan peningkatan suhu udara karena pemanasan global yang terus berlangsung, sehingga berdampak negatif bagi umbi yang dihasilkan. Disamping itu, informasi komprehensif tentang kultivar kentang Indonesia yang toleran terhadap suhu tinggi masih sangat terbatas. Tiga tahap penelitian telah dilakukan pada bulan Juli – Oktober 2016 dan 2017 dengan tujuan untuk (1) memilah kultivar kentang berdasar toleransinya terhadap suhu tinggi dan mengidentifikasi mekanisme pertahanannya, (2) mengidentifikasi pengaruh paclobutrazol untuk meningkatkan hasil umbi melalui penekanan kekuatan *sink* tajuk di dataran medium 380 mdpl, dan (3) mengidentifikasi potensi peningkatan hasil dan kualitas hasil umbi kentang di dataran medium 600 mdpl dengan pemakaian mulsa dan pemberian paclobutrazol. Hasil penelitian ke-1 menunjukkan bahwa tidak ada kultivar yang toleran suhu tinggi rata-rata 26,9°C. Olympus, Andina, Cingkariang dan Margahayu termasuk kultivar medium toleran dan kultivar Granola L, Granola K, Agria, Amabile, dan Tejo MZ termasuk peka suhu tinggi. Penurunan produksi umbi mencapai 62,2 - 76,8% (medium toleran) dan 84,1 - 96,9% (peka). Kultivar medium toleran dan peka menunjukkan mekanisme menghindar sebagai bentuk pertahanan terhadap suhu tinggi dengan indikator prolin meningkat, stomata tetap membuka, dan laju fotosintesis meningkat. Hasil penelitian ke-2 menunjukkan bahwa pemberian paclobutrazol (67,5 ml/tanaman) pada tanaman kentang di dataran medium 380 mdpl menyebabkan terjadinya cekaman ganda bagi tanaman. Hal ini dibuktikan dari bobot kering total semakin berkurang, indeks panen dan bobot segar umbi menunjukkan tren semakin menurun. Hasil penelitian ke-3 menunjukkan bahwa suhu udara dan tanah di dataran medium 600 mdpl sudah mendekati suhu optimum sehingga pertumbuhan kultivar yang diujikan (Andina, Olympus, Amabile) mendekati normal. Hasil umbi yang diperoleh pada kultivar medium toleran Olympus dengan mulsa jerami dan paclobutrazol dan Andina dengan mulsa jerami dengan ataupun tanpa paclobutrazol mampu menyamai hasil umbi di dataran tinggi. Hasil umbi pada kultivar peka Amabile dengan mulsa jerami dan paclobutrazol masih lebih rendah sekitar 20% dibanding hasil umbi di dataran tinggi. Namun, di 600 mdpl persentase bobot satuan umbi ukuran kecil (Grade C dan D) masih lebih banyak dibanding umbi ukuran besar (Grade A dan B) pada semua kultivar dan perlakuan percobaan. Dapat disimpulkan bahwa dataran medium 380 mdpl tidak sesuai untuk budidaya kentang medium toleran dan peka suhu tinggi, namun dataran medium 600 mdpl berpotensi untuk pengembangan tanaman kentang dengan pemberian mulsa jerami dan paclobutrazol. Untuk meningkatkan kekuatan *sink* umbi agar bobot satuan umbi meningkat, maka dosis paclobutrazol yang digunakan perlu ditingkatkan lebih besar dari 67,5 ml/tanaman.

## ABSTRACT

Potatoes are commodities originating from sub-tropical regions, that sensitive to high temperatures. The main constraints for developing potato commodities in Indonesia are the limited high-altitude plateau region and the high air temperature due to global warming that continues to occur, which harms potato tubers yield. Comprehensive information about Indonesian potato cultivars that are tolerant to high temperatures is still very limited. Three stages of research had been carried out in July - October 2016 and 2017 which aims to (1) Evaluate of potato cultivars based on their tolerance to high temperatures and identify their defense mechanisms, (2) identify the effect of paclobutrazol to improve tuber yield through suppressing canopy sink strength in the 380 m asl medium plains, and (3) identify the potency to improved yield and quality of potato tubers in the 600 m asl medium plains by using mulch and paclobutrazol. The results of the first study showed that there were no cultivars that tolerant to high temperatures with an average of 26.9°C. Olympus, Andina, Cingkariang, and Margahayu were included to medium tolerant cultivars and Granola L, Granola K, Agria, Amabile, and Tejo MZ, were included as high-temperature sensitive cultivars. The decline in tuber production reached 62.2 - 76.8% (medium tolerant) and 84.1 - 96.9% (sensitive). Tolerant and medium sensitive cultivars exhibited avoidance mechanism as a form of defense against high temperatures which indicated with proline content increased, stomata remain opened and photosynthesis rate increased. The results of the second study showed that the application of paclobutrazol (67,5 ml/plant) in the 380 m asl medium plains caused double stress to all tested cultivars. This was indicated by the decrease of total dry weight, the harvest index and the tuber fresh weight. The results of the third study showed that the air and soil temperatures in the 600 m asl medium plains were almost optimum for the potato plant growth, therefor all the tested cultivars (Andina, Olympus, Amabile) showed normal growth. Tuber yields of Olympus and Andina with straw mulch and paclobutrazol and with straw mulch with or without paclobutrazol treatments were equal to their yields in the highlands. Tuber's yield of Amabile with straw mulch and paclobutrazol treatment was around 20% lower than its yields in the highlands. However, at 600 m asl, the percentage tubers of grade C and D (small size) were higher than grade A and B (large size), in all cultivars and experimental treatments. It could be concluded that the 380 m asl medium plains were not suitable for the cultivation of medium tolerant and high-temperature sensitive potato cultivars. Meanwhile, the 600 m asl medium plains with the use of straw mulch and paclobutrazol was potential for the development of potato plants. To increase the tuber sink strength and increase the weight of a unit tuber, then it was advised to add the dosage of paclobutrazol more than 67,5 ml/plant.